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JULY 1978 Number 407 - Part I

Solar-Geophysical Data prompt reports

Data for June 1978 -- May 1978
Explanation of Data Reports Issued as Number 402 (Supplement) February 1978

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Solar - Geophysical Data

NO. 407 JULY 1978

Part I (Prompt Reports)

DATA FOR
JUNE 1978
MAY 1978

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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SOLAR-GEOPHYSICAL DATA

No. 407

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Chief
Solar-Terrestrial Physics Division

CONTENTS

PAGE

Part I (Prompt Reports)

Index for 1977 and 1978 2

Data for June 1978 3-41

Data for May 1978 43-169

Part II (Comprehensive Reports)

Index for 1977 and 1978 2

Data for January 1978 3-37

Data for December 1977 39-49

Miscellaneous Data 51-71

Solar Radio Waves
Spectral Observations; Harvard, Manila and Sagamore Hill; May 1978
Spectral Observations, Culgoora, April 1978
Selected Events by Radioheliograph, April 1978

Cosmic Rays
Neutron Monitor Daily Values, Alert and Deep River, March - April 1978
Chart of Variations, Alert and Deep River, April 1978

INDEX FOR 1977 AND 1978 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

		1977 Aug	Sep	Oct	Nov	Dec	1978 Jan	Feb	Mar	Apr	May	Jun
A.	SOLAR AND INTERPLANETARY PHENOMENA											
A.1	Sunspot Drawings	398A 36	399A 34	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.2a	Zurich Provisional Relative Sunspot Numbers Rz	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.2b	Zurich Final Sunspot Numbers Rz	404A 7	404A 8	404A 8	404A 8	404A 8						
A.2c	American Relative Sunspot Numbers RA'	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.3a	Mt. Wilson Magnetograms	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	404A 40	405A 49	406A 54	407A 46	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	398A 98	399A 94	400A 92	401A 96	402A100	403A108	404A 96	405A110	406A114	407A108	
A.3c	Kitt Peak Magnetograms	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	404A 40	405A 48	406A 54	407A 46	
A.3d	Mean Solar Magnetic Field (Stanford)	397A 25	398A 29	399A 29	400A 24	401A 31	402A 33	404A 33	404A 33	405A 36	406A 40	407A 40
A.4	H-alpha Filtergrams	398A 36	399A 34	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.5	Calcium Plage Drawings - McMath (or Catania)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.5a	Calcium Plage (McMath) and Sunspot Regions	398A 98	399A 94	400A 92	401A 96	402A100	403A108	404A 96	405A110	406A114	407A109	
A.5b	McMath Daily Calcium Plage Indices	398A105	399A 99	400A 99	401A100	402A105	403A114	404A104	405A119	406A124	407A118	
A.6	H-alpha Synoptic Charts	398A 34	399A 32	400A 28	401A 35	402A 36	403A 44	404A 38	405A 46	406A 52	407A 44	
A.6b	Synoptic Chart and Active Regions (Paris)	402B 4	403B 4	404B 4	405B 4	406B 4	407B 4					
A.7f	Helium D3 Chromosphere (Big Bear)	397A 19	398A 24	399A 24	400A 21	401A 28	402A 29	403A 36	404A 29	405A 31	406A 35	407A 34
A.7g	Helium Synoptic Maps (KPNO)	397A 20	398A 22	399A 23	400A 20	401A 27	402A 28	403A 35	404A 27	405A 32	406A 36	407A 36
A.7h	Coronal Line Emission (Sac Peak)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	404A 40	405A 48	406A 54	407A 46	
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.8q	Daily Values of Adjusted Solar Flux (AFGL)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.9cb	8.6 mm Radio Maps of the Sun (NOSC - La Posta)	398A 36	400B 57	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.9d	2 cm Radio Maps of the Sun (NOSC - La Posta)	398A 36	400B 52	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.10a	169 MHz - Interferometric Observations (Nancay)	397A 13	398A 14	399A 14	400A 12	401A 15	402A 16	403A 20	404A 17	405A 17	406A 19	407A 20
A.10c	21 cm East-West Solar Scans (Fleurs)	397A 15	398A 16	399A 16	400A 14	401A 17	402A 19	403A 23	404A 20	405A 20	406A 22	407A 23
A.10d	43 cm East-West Solar Scans (Fleurs)	397A 16	398A 17	399A 17	400A 15	401A 18	402A 20	403A 24	404A 21	405A 21	406A 23	407A 24
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	397A 14	398A 15	399A 15	400A 13	401A 16	402A 18	403A 22	404A 19	405A 19	406A 21	407A 22
A.10f	3 cm East-West Solar Scans (Toyokawa)					403B 68	402A 17	403A 21	404A 18	405A 18	406A 20	407A 21
A.11k	Solar X-ray Radiation (SOLRAD 11)						403A116	404A108	405A122	406A129	407A123	
A.11g	Solar X-ray (SMS/GOES)	---	398A 25	399A 20	400A 17	401A 22	402A 24	403A 29	404A 24	405A 29	406A 30	407A 29
A.11h	Solar X-ray (OSO-8; 1975-057A)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	404A 40	405A 48	406A 54	407A 46	
A.11i	Solar X-ray (Columbia U.)	404B 65	404B 69	404B 40								
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	397A 23	----	399A 26	----	----	402A 30	----	----	----	----	----
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	---	----	399A 27	----	----	402A 31	----	----	----	----	----
A.12e	Energetic Solar Particles (IMP H & J)	402B 24	403B 37	404B 35	405B 22	406B 43	407B 33					
A.12f	Energetic Solar Particles (GMS/SEM)	---	406B 78	----	----	----	---	----	----	----	406A 44	----
A.13a	Solar Wind (Pioneers 6 & 7)	397A 23	----	399A 26	----	----	402A 30	----	----	----	----	----
A.13ab	Solar Wind (Pioneers 8 & 9)	---	----	399A 27	----	----	402A 31	----	----	----	----	----
A.13d	Solar Wind from IPS Measurements	397A 27	398A 27	399A 25	400A 25	401A 29	402A 34	403A 37	404A 31	405A 37	406A 41	407A 35
A.13e	Solar Plasma (IMP H & J)	402B 23	403B 22	404B 34								
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	----	----	----	----	----	----	----	----	----	----
A.17	Interplanetary Magnetic Field (Pioneer 9)	---	----	----	----	----	402A 31	----	----	----	----	----
A.17c	Inferred IP Magnetic Field	397A 24	398A 28	400A 22	400A 22	401A 30	402A 32	403A 38	404A 32	406A 38	406A 38	407A 38
A.18	Interplanetary Electric Field (Pioneer 8)	---	----	399A 27	----	----	----	----	----	----	----	----
A.18	Interplanetary Electric Field (Pioneer 9)	----	----	----	----	----	402A 31	----	----	----	----	----
B.	IONOSPHERIC (AND RADIO WAVE PROPAGATION) PHENOMENA											
B.52	Graphs of Transmission Frequency Range	398A124	399A128	400A120	401A116	402A132	403A148	404A144	405A158	406A171	407A168	
B.53	Quality Figures Based on Frequency Ranges	398A126	399A127	400A122	401A118	402A131	403A150	404A146	405A157	406A170	407A167	
C.	FLARE-ASSOCIATED EVENTS											
C.1a	Optical Observations Flares	397A 10	398A 10	399A 10	400A 10	401A 10	402A 12	403A 12	404A 12	405A 12	406A 12	407A 12
C.1ba	Optical Observations Flares (Standardized Data)	402B 8	403B 8	404B 8	405B 8	406B 8	407B 8					
C.1d	Flare Patrol Observations	397A 12	398A 13	399A 13	400A 11	401A 14	402A 15	403A 19	404A 16	405A 16	406A 18	407A 19
C.1d	Flare Patrol Observations	402B 17	403B 21	404B 22	405B 16	406B 25	407A 22					
C.1e	Flare Indices (by day)	402B 16	403B 20	404B 21	405B 15	406B 24	407A 21					
C.1f	Flare Indices (by Region)	403B 53	404B 53	405B 38	406B 59	407B 49						
C.3	Solar Radio Waves - Outstanding Occurrences	402B 18	403B 22	404B 23	405B 17	406B 26	407B 23					
	Solar Radio Waves - Fixed Frequencies - Selected	397A 17	398A 18	399A 18	400A 16	401A 19	402A 21	403A 25	404A 22	405A 22	406A 24	407A 25
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	399B 36	399A113	401B 44	403B 64	403B 65	405B 45	405B 48	406B 62	407B 67	407A151	
C.4a	Solar Radio Spectral Obs. (Fort Davis)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	406A144	407B 52	
C.4d	Solar Radio Spectral Obs. (Culgoora)	400B 62	399A102	401B 38	403B 56	403B 59	404B 56	405B 40	406B 64	407B 59	407A139	
C.4e	Solar Radio Spectral Obs. (Weissenau)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	406A144	407A139	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	406A144	407B 52	
C.4h	Solar Radio Spectral Obs. (Owingeloo)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	---	---	
C.4i	Solar Radio Spectral Obs. (Durnten)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	406A144	407A139	
C.4j	Solar Radio Spectral Obs. (Manila)		399A102	400A101	401A102	402A108	406B 70	404A122	405A139	406A144	407B 52	
C.5e	Solar X-ray (SMS/GOES)	397A 22	399B 37	399A 22	400A 19	401A 24	402A 26	403A 29	404A 26	---	406A 32	407A 29
C.5f	Solar X-ray (Columbia U.)											
C.6	Sudden Ionospheric Disturbances	398A106	399A100	400A100	401A101	402A106	403A115	404A105	405A120	406A125	407A119	
D.	GEOMAGNETIC AND MAGNETOSPHERIC PHENOMENA											
D.1a	Geomagnetic Indices Ko, Kn, Ks, Km, Ko, aa, Cp	398A117	399A120	400A113	401A109	402A125	403A142	404A139	405A151	406A162	407A160	
D.1ba	27-day Chart of Ko Indices	398A119	399A122	400A115	401A111	402A127	403A144	404A141	405A153	406A164	407A162	
D.1c	27-day Chart of C9	404A142	404A142	404A142	404A142	404A142						
D.1d	Principal Magnetic Storms	398A122	399A125	400A118	401A114	402A130	403A145	404A143	405A156	406A167	407A165	
D.1e	Reduced Magnetograms								405A 39			
D.1f	Sudden Commencement and Solar Flare Effects	398A123	399A126	400A119	401A115	403B 69	403A147	405B 55	406B 72	406A169	407A166	
D.1g	Equatorial Indices Dst	398A121	399A124	400A117	401A113	402A129	405B 53	405B 54	405A155	406A166	407A164	
F.	COSMIC RAYS											
F.1a	Cosmic Ray Neutron Counts (Deep River)	398A116	399A115	400A112	402B 47	402A124	403A138	404A138	405A150	407B 70	407A155	
F.1b	Cosmic Ray Neutron Counts (Climax)	398A116	399A115	400A112	401A108	406B 73	406B 73	406B 73	406B 73	406A161		
F.1e	Cosmic Ray Neutron Counts (Alert)	398A116	399A115	400A112	402B 47	402A124	403A138	404A138	405A150	407B 70	407A155	
F.1f	Cosmic Ray Neutron Counts (Calgary)	400B 70	400B 70	402B 47								
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)	400B 70	---	402B 47								
F.1h	Cosmic Ray Neutron Counts (Thule)											
F.1i	Cosmic Ray Neutron Counts (Kiel)	398A116	399A115	400A112	401A108	402A124	403A138	404A138	405A150	406A161	407A155	
F.1j	Cosmic Ray Neutron Counts (Tokyo)	398A116	399A115	400A112	401A108	402A124	403A138	404A138	405A150	406A161	407A155	
F.1k	Cosmic Ray Neutron Counts (Kula)	398A116										
H.	MISCELLANEOUS											
H.60	IUWDS Alert Decisions	397A 4	398A 4	399A 4	400A 4	401A 4	402A 5	403A 5	404A 4	405A 4	406A 4	407A 4
H.62	Abbreviated Calendar Record	403B 46	404B 46	405B 30	406B 52	407B 42						

Notes:

"398A 36" listed under 1977 Aug means that data for August 1977 were contained in *Solar-Geophysical Data* Number 398 - Part I, beginning on page 36.

A = Part I, B = Part II.

------ = no data available.
blank = data not yet received.

JUNE 1978 DATA

Contents

	Page
Alert Period	
IUWDS Alert Periods (Advance and Worldwide)	4-7
Daily Solar Indices	
12-Month Tables Sunspot Numbers, R_Z, and 2800 MHz Flux Adjusted to 1 A.U.	8
Combined Table Sunspot Numbers and Solar Fluxes	9
Graph of Sunspot Cycles	10
Zürich Smoothed Observed and Predicted Sunspot Numbers	11
Solar Flares	
Hα Solar Flares	12-18
No-Flare-Patrol Chart	19
Solar Radio Waves	
169 MHz Solar Interferometric Chart - Nancay	20
3 cm East-West Solar Scans - Toyokawa	21
10.7 cm East-West Solar Scans - ARO, Ottawa	22
21 cm East-West Solar Scans - Fleurs	23
43 cm East-West Solar Scans - Fleurs	24
Selected Fixed-Frequency Occurrences	25-27
Selected Solar Noise Burst	28
Solar X-ray Radiation	
SMS-2 GOES	29-33
Solar Wind Measurements	
Scintillation Observations	34
Coronal Holes	
Helium D3 Chromosphere	35
Helium 10830 Å Synoptic Map	36-37
Inferred IP Magnetic Field Polarities	38
Mean Solar Magnetic Field	
Stanford Mean Solar Magnetic Field Map	39
Stanford Mean Solar Magnetic Field Table	40
Geomagnetic	
Boulder Geomagnetic Substorm Log	41

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

JUNE 1978

PRESTO MESSAGES (THE RAPID REPORT OF MAJOR EVENTS).

02 June 1978, BOULDER 02/1455Z POLCAP ABSORPTION BEGAN 31/1800Z MAXIMUM 1.1 DB ABSORPTION 01/1200Z. PROTON EVENT BEGAN 02/0730Z 11 PROTONS/CM2/SEC/STER 02/0730Z MAXIMUM 19 PROTONS/CM2/SEC/STER 02/0915Z.
22 JUNE 1978, BOULDER 22/1945Z SOFLARE 2B/M2 N17E17 22/1645Z DURATION 96 MINUTES.
24 JUNE 1978, BOULDER 24/1430Z PROTON EVENT BEGAN 24/0900Z 25 PROTONS/CM2/SEC/STER AT GREATER THAN 10 MEV 24/1345Z.
26 JUNE 1978, BOULDER 26/1638Z SOFLARE 2B/M3 N14W14 26/1529Z DURATION 73 MINUTES. TENFLARE 1024 FLUX UNITS 26/1530Z IN PROGRESS 26/1638Z.

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
152	1	31	232	148	16	N18W53	2	1	0	SOFLARE 2B/M5	31	N18W53	A	SOLALERT PIANO 01
						N25W34	0	0	0	N23W50 31/1009Z		N25W34	Q	MAGNIL
						N23W63	2	0	0	DURATION 140		N23W63	Q	
						N21W08	1	0	0	MINUTES. THREE		N21W08	Q	
						S15W53	0	0	0	PARALLEL RIBBONS		S15W53	Q	
						S24E03	0	0	0	WITH UMBRAL COVER-		S24E03	Q	
						S22W84	0	0	0	AGE.		S22W84	Q	
						S17W33	2	0	0			S17W33	Q	
						S19W19	0	0	0			S19W19	Q	
						N35W58	0	0	0			N35W58	Q	
						S27E18	0	0	0			S27E18	Q	
153	2	1	220	145	09	N17W67	1	0	0		1	N17W67	C,A	SOLALERT
						N24W47	4	1	0			N24W47	Q	MAGQUIET
						N21W75	2	0	0			N21W75	D,A	
						N21W21	6	0	0			N21W21	D,A	
						S17W66	7	0	0			S17W66	D,A	
						S17W45	0	0	0			S17W45	Q	
						S19W33	0	0	0			S19W33	Q	
						S24E06	0	0	0			S24E06	Q	
154	3	2	164	145	43	N17W80	0	0	0	POLCAP ABSORPTION	2	N17W80	Q	SOLALERT
						N26W60	3	0	0	BEGAN 31/1800Z		N26W60	A	MAGALERT
						N22W35	1	0	0	MAXIMUM 1.1 DB		N22W35	A	
						S17W79	2	0	0	ABSORPTION 01/1200Z		S17W79	C,A	
						S17W58	0	0	0	PROTON EVENT BEGAN		S17W58	Q	
						S17W46	0	0	0	02/0730Z 11 PRO-		S17W46	Q	
						S24W05	0	0	0	TONS/CM2/SEC/STER		S24W05	Q	
						N15E08	0	0	0	02/0730Z MAXIMUM		N15E08	Q	
						S21E22	0	0	0	19 PROTONS/CM2/		S21E22	Q	
						N19E75	0	0	0	SEC/STER 02/0915Z.		N19E75	Q	
155	4	3	143	127	25	N26W72	2	0	0		3	N26W72	C,A	SOLALERT
						N22W48	0	0	0			N22W48	C,A	MAGNIL
						S16W72	0	0	0			S16W72	Q	
						S17W59	0	0	0			S17W59	Q	
						N14W05	0	0	0			N14W05	Q	
						S22E09	0	0	0			S22E09	Q	
						N17E63	0	0	0			N17E63	Q	
						S26W19	0	0	0			S26W19	Q	
156	5	4	74	115	11	N24W84	0	0	0		4	N24W84	Q	SOLNIL
						N22W63	0	0	0			N22W63	Q	MAGALERT 05/05
						S27W30	1	0	0			S27W30	E	
						S22W02	0	0	0			S22W02	Q	
						N18E51	0	0	0			N18E51	Q	
157	6	5	91	114	35	N21W75	4	1	0		5	N21W75	E	SOLQUIET
						S27W44	0	0	0			S27W44	Q	MAGALERT MINOR 06
						S22W15	0	0	0			S22W15	Q	
						N20E37	0	0	0			N20E37	Q	
						N14W03	0	0	0			N14W03	Q	
158	7	6	63	107	07	N22W88	0	0	0		6	N22W88	Q	SOLQUIET
						S27W59	0	0	0			S27W59	Q	MAGNIL
						S21W28	0	0	0			S21W28	Q	
						N19E23	0	0	0			N19E23	Q	
159	8	7	80	107	09	S26W72	5	0	0		7	S26W72	Q	SOLQUIET
						S20W41	0	0	0			S20W41	Q	MAGQUIET
						N17E11	0	0	0			N17E11	Q	
						S15W38	0	0	0			S15W38	Q	
						S12E56	0	0	0			S12E56	Q	
160	9	8	64	106	11	S26W85	3	0	0		8	S26W85	Q	SOLQUIET
						N17W03	0	0	0			N17W03	Q	MAGQUIET
						S15W54	0	0	0			S15W54	Q	
						S11E42	0	0	0			S11E42	Q	
						N18E69	1	0	0			N18E69	Q	
161	10	9	67	103	06	N13W59	0	0	0		9	N13W59	Q	SOLQUIET
						S14W68	0	0	0			S14W68	Q	MAGQUIET
						S12E30	0	0	0			S12E30	Q	
						N18E57	0	0	0			N18E57	Q	
						N18E07	0	0	0			N18E07	Q	
162	11	10	60	105	12	N14W72	0	0	0		10	N14W72	Q	SOLQUIET
						S12E16	0	0	0			S12E16	Q	MAGQUIET
						N17E43	0	0	0			N17E43	Q	
						N15E15	0	0	0			N15E15	Q	
163	12	11	100	110	12	N19W38	0	0	0		11	N19W38	Q	SOLQUIET
						N18E31	0	0	0			N18E31	Q	MAGQUIET
						N18W21	0	0	0			N18W21	Q	
						N17W00	0	0	0			N17W00	Q	
						S32E47	1	0	0			S32E47	Q	
						N17E75	0	0	0			N17E75	Q	
						N24E34	0	0	0			N24E34	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

JUNE 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
164	13	12	120	116	08	N18E14	0	0	0		12	N18E14	Q	SOLQUIET
						N17W34	0	0	0			N17W34	Q	MAGQUIET
						N17W13	14	0	0			N17W13	E	
						S32E33	2	0	0			S32E33	Q	
						N16E65	1	0	0			N16E65	Q	
						N24E20	0	0	0			N24E20	Q	
						N19E76	2	0	0			N19E76	Q	
165	14	13	127	117	06	N17E01	0	0	0		13	N17E01	Q	SOLQUIET
						N17W25	19	0	0			N17W25	E	MAGQUIET
						S33E18	0	0	0			S33E18	Q	
						N15E52	1	0	0			N15E52	Q	
						N18E62	0	0	0			N18E62	Q	
						N24E28	0	0	0			N24C28	Q	
						N18W07	0	0	0			N18W07	Q	
						N16E10	0	0	0			N16E10	Q	
166	15	14	94	125	06	N17W62	2	0	0		14	N17W62	Q	SOLQUIET
						N17W41	5	0	0			N17W41	Q	MAGQUIET
						N16E38	1	0	0			N16E38	Q	
						N18E48	2	0	0			N18E48	Q	
						N24E14	0	0	0			N24E14	Q	
167	16	15	158	128	07	N17W75	0	0	0		15	N17W75	Q	SOLQUIET
						N17W53	2	0	0			N17W53	E	MAGQUIET
						N18W35	0	0	0			N18W35	Q	
						N19W24	0	0	0			N19W24	Q	
						N17W16	1	0	0			N17W16	Q	
						N24E02	2	0	0			N24E02	Q	
						N17E28	0	0	0			N17E28	Q	
						N18E37	0	0	0			N18E37	Q	
						S23E72	0	0	0			S23E72	Q	
168	17	16	102	137	06	N16W68	3	0	0		16	N16W68	E	SOLQUIET
						N16W30	0	0	0			N16W30	Q	MAGALERT MINOR RECURRENCE 17/19
						N25W12	1	0	0			N25W12	E	
						N20W11	0	0	0			N20W11	Q	
						N16E15	1	0	0			N16E15	E	
						N18E22	0	0	0			N18E22	Q	
						S25E60	2	0	0			S25E60	E	
												S15E85	C,E	
169	18	17	198	144	12	N17W78	1	0	0		17	N17W78	E	SOLALERT 18/XX
						N15W42	2	0	0			N15W42	C,A	MAGALERT 18/19
						N18W24	1	0	0			N18W24	Q	
						N23W22	1	0	0			N23W22	Q	
						N18E03	0	0	0			N18E03	Q	
						N18E09	2	0	0			N18E09	C,A	
						N11E23	0	0	0			N11E23	Q	
						N11E29	0	0	0			N11E29	Q	
						S23E47	0	0	0			S23E47	C,A	
						S15E65	0	0	0			S15E65	Q	
						S32E74	0	0	0			S32E74	Q	
						N19E76	1	0	0			N19E76	E	
170	19	18	265	151	09	N17W11	0	0	0		18	N17W11	E	SOLALERT 19/XX
						N19W02	1	0	0			N19W02	Q	MAGALERT MINOR 19/20
						N24W38	1	0	0			N24W38	E	
						N15W56	3	0	0			N15W56	E	
						S25E34	0	0	0			S25E34	C,A	
						N18W38	1	0	0			N18W38	Q	
						S17W45	0	0	0			S17W45	Q	
						N19E63	0	0	0			N19E63	C,E	
						N10E16	0	0	0			N10E16	Q	
						N33E64	0	0	0			N33E64	Q	
						N11E10	0	0	0			N11E10	Q	
						S20W26	0	0	0			S20W26	Q	
						S32W06	0	0	0			S32W06	Q	
												N17E86	C,A	
171	20	19	208	160	16	N17W24	2	0	0		19	N17W24	Q	SOLNIL
						N18W13	1	0	0			N18W13	Q	MAGALERT MINOR 20
						N24W51	1	0	0			N24W51	Q	
						N16W70	0	0	0			N16W70	Q	
						S25E20	0	0	0			S25E20	Q	
						N16W44	0	0	0			N16W44	Q	
						N17E51	0	0	0			N17E51	Q	
						N09E02	0	0	0			N09E02	Q	
						N29E49	0	0	0			N29E49	Q	
						N16E69	0	0	0			N16E69	Q	
						N26E82	0	0	0			N26E82	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

JUNE 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	Flares: Total	Flares: M	Flares: X	Outstanding events	Forecasts: Date	Forecasts: Location Lat-Long	Forecasts: Desc[a]	Alert Situations
172	21	20	214	169	11	N18W38	1	0	0		20	N18W38	Q	SOLALERT 21/23
						N20W24	0	0	0			N20W24	Q	MAGNIL
						N26W64	1	0	0			N26W64	Q	
						N17W82	0	0	0			N17W82	Q	
						S25E07	1	0	0			S25E07	Q	
						S17E30	0	0	0			S17E30	Q	
						N17W37	1	0	0			N17W37	Q	
						N12W12	0	0	0			N12W12	Q	
						N30E38	0	0	0			N30E38	Q	
						N16E60	1	0	0			N16E60	E	
						N25E64	1	0	0			N25E64	E	
						S22E74	5	1	0			S22E74	A	
						S17E42	1	0	0			S17E42	Q	
173	22	21	232	184	20	N17W52	0	0	0		21	N17W52	Q	SOLALERT MINOR 22
						N19W38	0	0	0			N19W38	Q	MAGQUIET
						S24W00	0	0	0			S24W00	Q	
						S13E15	0	0	0			S13E15	Q	
						N19E26	0	0	0			N19E26	Q	
						N12W75	4	0	0			N12W75	Q	
						N31E25	0	0	0			N31E25	Q	
						N17E46	1	0	0			N17E46	E	
						N25E50	0	0	0			N25E50	Q	
						S20E61	6	0	0			S20E61	E	
						S17E28	0	0	0			S17E28	Q	
						S21W55	0	0	0			S21W55	Q	
						N18E14	0	0	0			N18E14	Q	
						N20E72	0	0	0			N20E72	Q	
174	23	22	255	183	10	N17W65	0	0	0	SOFLARE 2B/M2	22	N17W65	Q	PROTON FLARE ALERT 23/25
						S24W16	1	0	0	N17E17 22/1645Z		S24W16	D,E	MAGQUIET
						S13E03	0	0	0	DURATION 96		S13E03	Q	
						N17E13	2	1	0	MINUTES.		N17E13	D,A	
						N12W37	2	0	0			N12W37	D,E	
						N13E14	0	0	0			N13E14	Q	
						N12E33	1	0	0			N12E33	C,A	
						N24E39	2	0	0			N24E39	D,E	
						S18E49	3	2	0			S18E49	C,A	
						S16E15	0	0	0			S16E15	Q	
						N21E61	3	0	0			N21E61	C,E	
						N13E03	0	0	0			N13E03	Q	
175	24	23	254	190	13	N17W77	0	0	0		23	N17W77	Q	SOLALERT 24/XX
						S25W28	1	0	0			S25W28	Q	MAGQUIET
						S14W11	0	0	0			S14W11	Q	
						N17E02	0	0	0			N17E02	Q	
						N12W52	0	0	0			N12W52	Q	
						N31E02	0	0	0			N31E02	Q	
						N16E11	0	0	0			N16E11	Q	
						N24E25	6	1	0			N24E25	C,A	
						S20E36	3	0	0			S20E36	C,A	
						N21E48	7	0	0			N21E48	C,A	
						N13W10	0	0	0			N13W10	Q	
						S32W19	0	0	0			S32W19	Q	
176	25	24	376	189	20	N18W90	1	0	0	PROTON EVENT BEGAN	24	N18W90	Q	SOLALERT 25/XX
						S25W41	0	0	0	24/0900 25 PROTONS		S25W41	Q	MAGALERT 25/26
						S16W26	0	0	0	CM2/SEC/STER AT		S16W26	Q	
						N18W11	1	0	0	GREATER THAN 10		N18W11	Q	
						N12W66	0	0	0	MEV 24/1345Z.		N12W66	Q	
						N17E08	1	0	0			N17E08	E	
						N25E12	1	0	0			N25E12	E	
						S20E24	8	0	0			S20E24	C,P	
						N22E36	1	0	0			N22E36	E	
						N13W23	0	0	0			N13W23	Q	
						S31W31	0	0	0			S31W31	Q	
						S19E02	0	0	0			S19E02	Q	
						N17E41	0	0	0			N17E41	Q	
177	26	25	334	178	14	S27W56	0	0	0		25	S27W56	Q	SOLALERT 26/XX
						S16W38	1	0	0			S16W38	Q	MAGNIL
						N18W25	1	0	0			N18W25	E	
						N12W79	0	0	0			N12W79	Q	
						N17W04	2	0	0			N17W04	C,A	
						N26W01	2	0	0			N26W01	E	
						S20E11	2	0	0			S20E11	C,A	
						S15W25	1	0	0			S15W25	Q	
						N23E23	2	0	0			N23E23	C,A	
						N13W36	0	0	0			N13W36	E	
						S18W11	0	0	0			S18W11	E	
						N22E13	0	0	0			N22E13	E	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

JUNE 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
178	27	26	263	193	30	N18W37	4	0	0	SOFLARE 2B/M3	26	N18W37	Q	SOLALERT 27/29
						N17W18	3	1	0	N14W14 26/1529Z		N17W18	A	MAGALERT 28/XX
						N25W13	3	0	0	DURATION 73		N25W13	Q	
						S20W02	10	0	0	MINUTES. TENFLARE		S20W02	A	
						S14W38	0	0	0	1024 FLUX UNITS		S14W38	Q	
						N22E09	4	0	0	26/1530Z IN PROG-		N22E09	E	
						N12W49	1	0	0	RESS 26/1638Z.		N12W49	Q	
						S17W23	0	0	0			S17W23	Q	
						N22W00	0	0	0			N22W00	Q	
						N14E73	2	0	0			N14E73	E	
179	28	27	255	174	16	N17W32	2	0	0		27	N17W32	Q	SOLALERT MINOR 28
						N26W24	0	0	0			N26W24	Q	MAGALERT MINOR 28/29
						S20W15	7	0	0			S20W15	E	
						N22W01	3	0	0			N22W01	E	
						N15W62	2	0	0			N15W62	Q	
						N20W12	0	0	0			N20W12	Q	
						N15E51	3	0	0			N15E51	E	
						N19E56	0	0	0			N19E56	Q	
180	29	28	241	168	12	N17W46	6	0	0		28	N17W46	E	SOLNIL
						N26W37	0	0	0			N26W37	Q	MAGNIL
						S20W29	4	1	0			S20W29	E	
						N22W15	3	0	0			N22W15	E	
						N20W26	0	0	0			N20W26	Q	
						N15E38	4	0	0			N15E38	Q	
						N19E45	0	0	0			N19E45	Q	
						S17E60	1	0	0			S17E60	Q	
						N22E61	0	0	0			N22E61	Q	
181	30	29	207	162	15	N17W59	3	0	0		29	N17W59	C,A	SOLALERT 30/02
						N25W50	0	0	0			N25W50	Q	MAGALERT 30/01
						S19W42	3	0	0			S19W42	A	
						N22W28	8	0	0			N22W28	A	
						N17E21	4	0	0			N17E21	Q	
						N19E31	1	0	0			N19E31	Q	
						S16E47	1	0	0			S16E47	Q	
						N23E46	1	0	0			N23E46	Q	
						N19E79	0	0	0			N19E79	Q	
182	1	30	121	151	30	N19W74	4	0	0		30	N19W74	C,A	
						N26W62	0	0	0			N26W62	Q	
						S18W57	0	0	0			S18W57	Q	
						N24W40	10	0	0			N24W40	A	
						N16E06	4	0	0			N16E06	Q	
						N18E18	4	0	0			N18E18	Q	
						S17E35	1	0	0			S17E35	Q	
						N20E66	3	0	0			N20E66	C,E	

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

RELATIVE SUNSPOT NUMBERS

ZURICH, R_Z

	1977 FINAL						1978 PROVISIONAL					
DAY	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	42	17	22	43	44	28	84	128	93	70	77	119
2	45	15	29	37	48	28	88	120	83	68	85	93
3	42	24	29	47	25	31	102	131	95	71	91	74
4	39	19	25	47	22	47	102	136	103	75	76	68
5	48	23	20	48	25	58	73	137	76	94	74	51
6	48	26	26	55	27	58	69	129	67	92	73	29
7	25	28	25	57	34	55	42	121	90	88	70	39
8	20	25	18	52	27	45	36	89	99	105	56	45
9	17	30	30	47	31	58	36	94	85	126	59	36
10	23	25	48	38	25	75	15	96	92	111	57	29
11	9	23	45	28	26	71	18	95	85	109	63	57
12	8	29	51	33	27	62	26	92	78	107	65	62
13	10	40	48	53	28	44	26	93	65	93	72	56
14	7	40	47	48	31	37	36	82	62	75	72	62
15	8	42	53	54	39	41	30	59	72	61	78	89
16	8	38	56	53	49	39	23	64	70	85	91	97
17	8	36	53	51	51	29	24	56	66	99	79	103
18	8	40	60	50	54	33	14	55	72	100	85	115
19	7	35	59	54	52	40	8	53	64	107	84	109
20	8	33	60	54	38	23	7	52	51	115	74	109
21	8	33	58	42	32	23	20	63	77	112	73	154
22	23	38	42	35	28	17	30	74	82	109	73	158
23	30	15	41	30	24	23	43	69	85	105	72	158
24	38	19	48	29	18	31	37	78	82	102	82	154
25	42	25	46	28	10	35	32	94	70	139	86	135
26	42	34	49	38	9	41	47	86	53	115	84	152
27	37	38	54	38	14	50	69	79	50	98	97	134
28	26	36	61	37	9	45	79	88	49	75	98	130
29	16	43	64	42	10	58	90		48	72	103	115
30	10	36	68	45	23	64	104		44	70	107	99
31	8	31		52		67	118		70		109	
MEAN	21.4	30.1	44.0	43.8	29.1	43.2	49.3	89.8	73.5	94.7	79.3	94.1

1977 yearly mean = 27.5

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

	1977						1978					
DAY	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	102.8	83.8*	83.1	93.8*	94.4	88.4	126.9*	139.1	136.3	130.8	181.4	149.1
2	100.7	82.8	84.2	93.2	93.6	91.2	133.9	152.6	141.1	129.8	183.0	147.0*
3	97.4	82.3	87.2	97.4	90.4	93.7	130.2	156.6*	146.6	134.5	182.2A	130.8
4	94.0	82.9*	84.2	98.8	89.4	95.9	124.8	154.0	148.4	143.3*	178.4	118.6
5	88.8*	86.4	85.6	104.8*	90.6	96.9	119.2	159.8	154.5	146.7*	173.9*	116.9
6	90.2	88.2	84.9	103.5	91.1	102.0*	118.7*	156.1	162.8	145.3*	173.1	109.8
7	85.2	86.9	89.3	105.5	90.2	105.5	111.6	157.3	165.2	146.9	162.6*	110.6
8	82.1	85.1	91.6	103.8	90.3	106.7	102.8	157.0*	168.7	148.6	143.4	109.3
9	79.0	85.9	95.9	100.7	91.1	112.6*	97.0	155.2	163.7	156.1	135.1	106.5
10	76.9	87.2	99.8	96.4	93.1	114.7	93.5	148.7	179.1	155.4	129.5	108.4
11	76.2	87.6	104.6	95.3	94.9	107.4	93.1	154.2	175.2	162.8*	133.8	113.2
12	75.8	86.5	107.8	100.8	91.4	111.0	92.1	159.8	169.8	156.2	136.2	116.4*
13	77.8	89.0	112.9	98.5	94.0	100.6	90.3	151.2	160.9	145.6	140.2	120.3*
14	76.8	87.5	118.2	98.9	97.9	93.7*	88.6	148.4	160.5	139.1	143.7	126.4*
15	76.0	86.9	120.7	98.2	97.9	92.5	89.6	136.8	154.2	141.4	146.1	132.5
16	76.9	87.3	120.4	96.8	95.9	92.5	86.4	130.2	143.3	137.6	147.8*	139.5*
17	76.5	87.1	120.6	94.9	100.4	91.1	83.8	125.9	135.4	133.4	143.8	149.0
18	76.9	88.6	120.5	95.4	102.0*	93.6	84.7	124.9	132.3	134.1	135.6	153.5*
19	76.9	87.0	104.5	105.8	99.2	91.8	85.4	119.1	128.1	139.5*	133.6	162.0*
20	80.1	86.7	108.8	99.6*	95.7*	88.7	87.0	122.2	125.3	138.1	132.3*	174.2
21	81.7	90.8	104.9*	98.6*	92.8	87.8	91.4	122.2	118.2	138.4*	132.7	185.4*
22	83.1	89.6	102.4	93.9	89.3	89.9	96.9	127.7	117.8	146.4	135.7*	190.3
23	85.8	86.0	99.3	87.3	88.0	91.2	99.6	131.8	116.4	162.9	142.9*	196.7
24	84.8	86.0	100.6	88.3	86.7	93.9	100.4	135.6	117.5	159.8	146.5*	194.8
25	86.8	87.7	98.8	88.1	84.7	96.3	103.3	139.3	118.2	159.1*	147.6	183.5
26	86.8	86.4	99.4	88.6	84.1	99.3	112.7	134.8	112.5	166.7	152.8	182.4*
27	85.4	85.4	100.0	88.5	83.8	98.3	116.4	137.5	114.1	172.8	150.6*	179.5
28	87.5	82.4	100.8	90.3*	85.6	98.9	127.7*	135.4	112.7	176.6*	147.1*	174.1
29	86.7	86.1	99.4	90.3	85.6	105.6*	132.2*		111.1	185.2	148.6	167.4
30	84.1	85.5	97.7	94.9	85.3	114.7	134.9		115.4*	182.1*	147.2*	154.6*
31	80.4	84.7		95.9		120.2	133.3*		124.5		152.6	
MEAN	83.7	86.4	100.9	96.3	91.6	98.9	106.1	141.8	140.3	150.5	149.7	146.8

* adjusted for burst

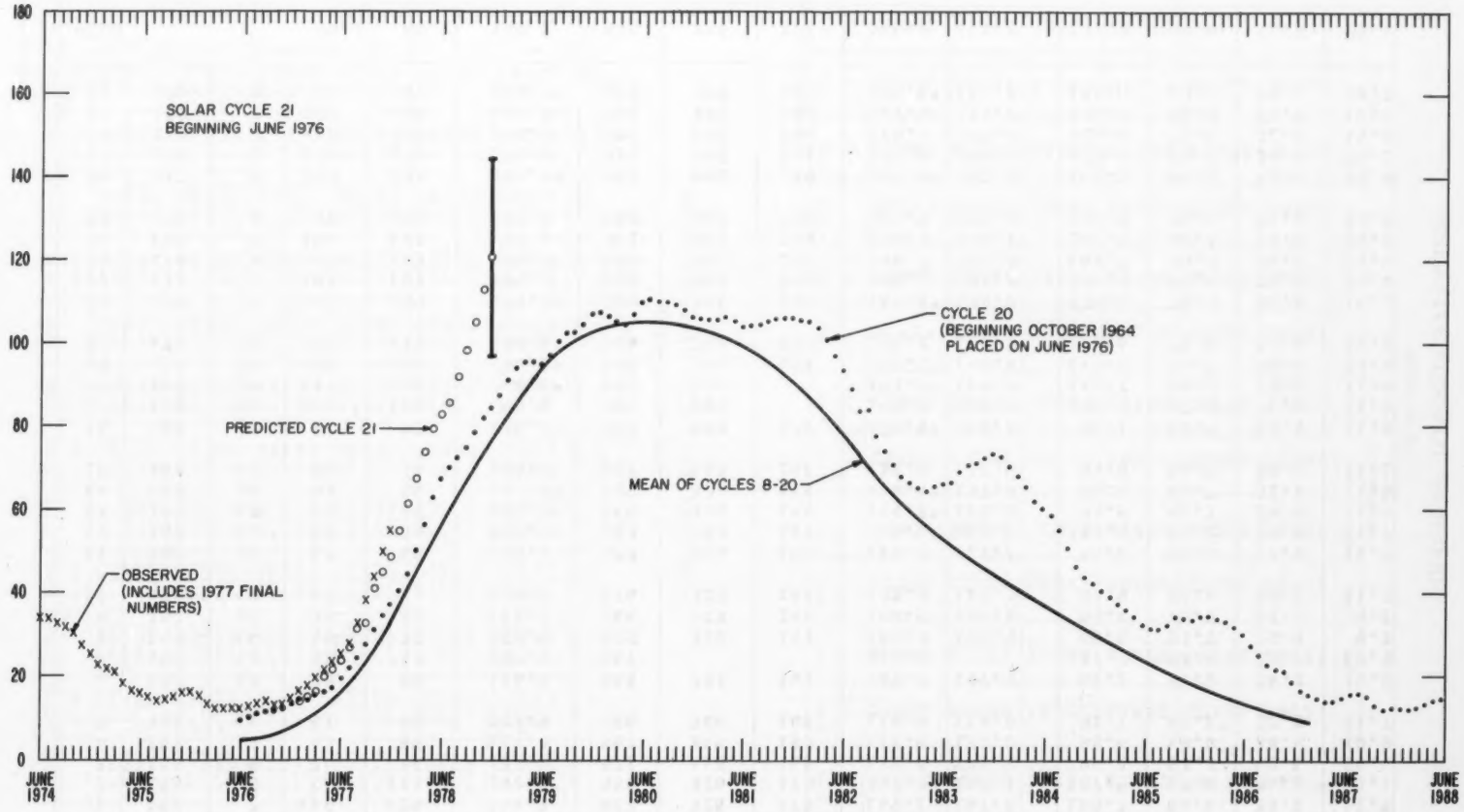
DAILY SOLAR INDICES

JUNE 1978

JUN 1978	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	152	7	119	126	144.9	582	328	179	149.1	147.0	105.7	64.5	33.0	12.5
2	153	8	93	111	142.9*	580	326	179	147.0*	147.1	107.5	65.8	34.6	15.1
3	154	9	74	76	127.1	571	313	162	130.8	128.8	94.2	63.3	40.5	14.4
4	155	10	60	55	115.3	567	315	153	118.6	120.0	86.4	58.4	30.4	10.9
5	156	11	51	49	113.5	556	306	148	116.9	116.0	91.7	62.7	32.0	11.7
6	157	12	29	29	106.6	565	297	143	109.8	107.9	82.2	57.2	24.0	10.5
7	158	13	39	37	107.4	567			110.6		82.7	58.4	26.7	10.9
8	159	14	45	33	106.1	555	300	143	109.3	106.9	85.6	57.9	25.9	9.3
9	160	15	36	21	103.3	564	303	142	106.5	108.0	80.8	55.5	23.3	9.2
10	161	16	29	21	105.1	574	305	142	108.4	108.3	80.9	56.4	30.0	11.2
11	162	17	57	46	109.8	573	304	150	113.2	111.7	86.6	59.3	27.9	10.7
12	163	18	62	39	112.9*	568	303	147	116.4*	114.8	88.4	60.2	29.9	11.7
13	164	19	56	59	116.6*	565	310	154	120.3*	122.2	93.5	62.7	28.8	11.0
14	165	20	62	54	122.5*	587	320	158	126.4*	137.9	98.6	64.7	30.1	11.9
15	166	21	89	83	128.4	587	330	166	132.5	133.4	98.9	60.5	28.3	11.1
16	167	22	97	73	135.2*	592	330	174	139.5*	141.8	98.1	67.7	29.4	11.5
17	168	23	103	104	144.4	594	325		149.0	148.6	109.3	67.0	31.5	11.9
18	169	24	115	106	148.6*	586	334		153.5*	159.5	111.7	68.0	29.5	11.4
19	170	25	109	101	156.8*	593	354	188	162.0*	166.0	119.4	69.7	26.8	13.4
20	171	26	109	117	168.6	584	350	203	174.2	181.0	125.6	71.2	31.4	12.0
21	172	27	154	149	179.5*	606	354	222	185.4*	198.8	137.6	76.3	32.8	14.1
22	173	1	158	157	184.2	595	358	222	190.3	201.0	144.0	76.4	28.9	14.4
23	174	2	158	153	190.4	588	361	222	196.7	203.3	140.7	74.9	34.9	15.4
24	175	3	154	138	188.6	601	360	220	194.8	206.1	142.8	69.3	33.0	24.0
25	176	4	135	114	177.6	589	347	205	183.5	182.0	132.2	74.1	31.0	13.0
26	177	5	152	133	176.4*	584	345	209	182.4*	192.1	142.2	84.2	42.4	35.9
27	178	6	134	130	173.6	584	330	201	179.5	183.5	129.8	84.7	38.9	24.1
28	179	7	130	128	168.4	581	335	194	174.1	177.8	120.8	70.8	32.3	15.0
29	180	8	115	110	161.9	581	335	191	167.4	171.0	114.0	66.9	30.5	12.6
30	181	9	99	87	149.5*	590	337	184	154.6*	161.8	106.5	63.7	29.1	12.2
MEAN			94.1	88.0	142.2	580	328	178	146.8	151.2	107.9	66.4	30.9	13.8

* Adjusted for burst.

Note: Data gaps in AFGL Sagamore Hill are due to equipment problems.



OBSERVED AND PREDICTED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1977	16.7	18.1	20.0	22.2	24.2	26.3	28.8	33.0	38.5	44.0	49.9	54.8
1978	60.6	66.6	72.6	78.9	85.9	92.1	97.0	101.4	105.6	109.4	113.9	120.3
	(3)	(5)	(8)	(10)	(13)	(15)	(18)	(21)	(24)	(25)	(25)	(24)
1979	125.7	130.3	134.6	137.4	140.0	144.5	149.0	151.8	153.3	153.9*	153.7	152.7
	(24)	(25)	(27)	(30)	(33)	(35)	(37)	(40)	(42)	(45)	(47)	(49)
1980	151.0	149.3	148.6	149.0	148.2	144.8	141.0	137.9	136.3	135.5	134.0	132.5
	(49)	(48)	(46)	(46)	(47)	(48)	(49)	(50)	(49)	(50)	(51)	(53)
1981	132.3	131.7	129.1	126.0	123.6	121.5	120.8	121.0	120.3	118.9	116.7	113.4
	(56)	(56)	(54)	(52)	(52)	(50)	(49)	(47)	(47)	(46)	(44)	(43)
1982	110.0	106.6	104.2	102.4	100.1	97.3	93.2	88.8	84.7	80.2	77.1	73.6
	(41)	(39)	(39)	(37)	(35)	(34)	(32)	(30)	(28)	(24)	(23)	(22)
1983	69.7	66.9	64.9	62.6	60.3	58.0	56.0	54.1	52.3	51.0	50.2	49.5
	(21)	(21)	(22)	(23)	(23)	(23)	(24)	(26)	(28)	(30)	(31)	(31)
1984	48.3	46.5	43.8	40.5	38.0	36.7	35.6	34.0	32.6	31.7	30.5	29.0
	(31)	(30)	(29)	(29)	(30)	(31)	(32)	(32)	(31)	(29)	(28)	(27)
1985	28.1	27.3	26.5	26.1	25.4	24.5	23.7	23.0	22.2	21.4	20.5	20.0
	(27)	(27)	(26)	(26)	(26)	(25)	(23)	(23)	(22)	(23)	(24)	(24)
1986	19.7	19.2	18.6	17.6	16.4	15.3	14.5	14.0	13.7	13.3	13.0	12.8
	(24)	(24)	(24)	(23)	(22)	(21)	(20)	(19)	(17)	(16)	(15)	(13)
1987	13.0	13.4	14.2	15.0	16.0							
	(12)	(11)	(11)	(11)	(12)							

The table gives observed Zürich smoothed sunspot numbers for Cycle 21 up to the one calculated from the latest observed data, marked by a vertical bar. They are based on final Zürich numbers through 1977 and provisional Zürich numbers thereafter. Some of these data after the June 1976 value will change slightly when final data for 1978 are received. The numbers after the vertical bar are predictions by the McNish-Lincoln method (see *Explanation of Data Reports*, February 1978). Shown in parentheses are the corresponding absolute values of the 90% confidence interval, an indication of the uncertainty above and below the predicted number.

The McNish-Lincoln method is very sensitive to the identification of a minimum epoch. In SGD 390-401 issues, the Cycle 21 predictions were based on March 1976 as the minimum epoch. Latest studies, including one published by Waldmeier, show that June 1976 is the more appropriate epoch of minimum. Thus, we have adopted a June 1976 mimimum.

*Prediction of Sunspot Maximum -- The McNish-Lincoln prediction method is recommended for predictions up to only one year ahead. From that point, the predictions regress rapidly towards the mean value. Combining this McNish-Lincoln prediction of sunspot maximum with the Ohl method (as done by Sargent, see *Explanation of Data Reports*, February 1978) indicates that the most probable value for sunspot maximum is 154 ± 37.

Hα SOLAR FLARES

JUNE 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		CORD.	TYPE	TIME UT	MEAS. AREA Millionths of Disk	CORR. AREA Sq. Deg.	
MITK	01	0006	0012	0108	N19	W08	.442	15319	31.4	62	1B		C	0012	420	4.7	E
BUCA	01	0649	0650	0700	N21	W10	.481		31.5	11	SF		C	0650	86	1.0	E
BUCA	01	0735E		0800D	N22	W09	.490		31.6	25D	SF		C	0745	53	.6	E
MONT	01	0940	1009	1016	S17	W59	.854		28.0	36	SF		C	1009	50		E
HTPR	01	1002	1003	1011	S18	W26	.470		30.5	9	SF		C	1003	10	.1	
HTPR	01	1027	1030	1034	N20	W17	.514		31.2	7	SF		C	1030	20	.2	E
RAMY	01	1142	1152	1159	S16	W59	.853		28.1	17	SB	3	C		22		F
HTPR	01	1151	1153	1153	S17	W56	.827		28.3	2	SF		C	1153	30	.5	
RAMY	01	1214	1215	1223	N25	W40	.763		29.5	9	SB	3	C		21		
RAMY	01	1326	1326	1354	N21	W17	.526		31.3	28	SB	3	C		25		F
RAMY	01	1328	1329	1333	N22	W70	.961		27.3	5	SB	3	C		16		F
HTPR	01	1329	1329	1332	N20	W66	.939		27.6	3	SN		C	1329	20	.4	E
HTPR	01	1350	1356	1406	S24	W90	.999		25.8	16	SN		C	1356	50		
RAMY	01	1448	1449	1540	N21	W18	.534		31.3	52	SN	3	C		259		F
RAMY	01	1448	1510	1540	N21	W18	.534		31.3	52	SB	3	C		116		F
HTPR	01	1448		1511D	N21	W07	.467		1.1	23D	SN		C	1501	130	1.3	E
MCMA	01	1457E		1541D	N21	W15	.511	15319	31.5	44D	SN		P	1457	80	.9	E
RAMY	01	1521	1526	1542	S16	W62	.879		28.0	21	SN	3	C		16		F
RAMY	01	1600	1602	1627	N21	W19	.542		31.2	27	SN	3	C		42		F
PALE	01	1658	1700	1702	S17	W64	.894		27.9	4	SN	3	C		16		DE
RAMY	01	1700	1701	1704	N21	W19	.542		31.3	4	SN	3	C		20		F
MCMA	01	1730	1738	1750	N20	W60	.902	15314	28.2	20	SN		C	1738	30	.6	E
RAMY	01	1732	1739	1747	N22	W72	.969		27.3	15	SN	3	C		25		F
PALE	01	1743	1744	1748	N21	W74	.976		27.2	5	SN	3	C		14		DE
PALE	01	1743	1743	1750	S17	W64	.894		27.9	7	SN	3	C		12		DE
PALE	01	1917	1917	1923	S17	W65	.902		27.9	6	SN	3	C		12		DE
PALE	01	1928	1928	1937	N20	W20	.539		31.3	9	SN	3	C		21		DE
PALE	01	1939	1939	1943	N16	W67	.939		27.8	4	SN	3	C		16		DE
MCMA	01	1939	1941	1946	N18	W66	.936	15314	27.9	7	SN		C	1941	30	.9	D
MCMA	01	1945	1952	1959D	N16	E37	.678	15333	4.6	14D	SN		C	1952	30	.4	EK
PALE	01	1947	1947	1952	S17	W66	.909		27.9	5	SN	3	C		15		DE
PALE	01	2113E	2113U	2115D	N23	W45	.795	15314	29.5	2D	1B	3	C		254		FDE
TEHR	02	0258	0303	0319	N25	W46	.814		29.7	21	SB	2	C		127		
HTPR	02	0652	0730	0845	N26	W32	.703		30.9	113	SF		C	0730	40	.4	
HTPR	02	0815	0822	0835	N22	W31	.661		31.0	20	SF		C	0822	10	.1	
MONT	02	0750	0754	0759	S18	W78	.973	15321	27.5	9	1N		C	0754	240		
HTPR	02	0843	0844	0849	S14	W78	.974		27.5	6	SF		C	0844	20		
HTPR	02	0952	0955	0957	S14	W78	.974		27.6	5	SF		C	0955	20		
HTPR	02	1103	1110	1118	S17	W80	.981		27.5	15	SN		C	1110	150		
PALE	02	1646	1647	1658	N23	W56	.882		29.5	12	SN	3	C		19		DE
RAMY	02	1647	1648	1655	N25	W56	.888		29.5	8	SB	2	C		26		F
RAMY	02	1648	1648	1652	N21	W32	.662		31.3	4	SN	2	C		48		F
PALE	02	1800	1809	1824	N23	W57	.889		29.5	24	SN	3	C		17		
PALE	02	1803	1803	1902	N23	W43	.778		30.5	59	SN	3	C		19		DE
PALE	02	1935	1937	1953	S17	W79	.977		27.9	18	SN	3	C		36		FDE
PALE	02	2121	2122	2138D	S17	W80	.981		27.9	17D	SB	3	C		15		DE
PALE	02	2307E	2313U	2330D	N25	W60	.914		29.5	23D	SN	3	C		72		FDE
TEHR	03	0535	0542	0551	N26	W65	.944		29.4	16	SB	1	C		95		
HTPR	03	0738	0743	0750	N28	W63	.937		29.6	12	SN		C	0743	20	.4	
HTPR	03	1408	1408	1412	N22	W42	.764		31.4	4	SF		C	1408	20	.3	
MONT	05	0729E	0736	0812	N23	W68	.954	15319	31.2	43D	1B		C	0736	300		
TEHR	05	0730E	0738	0803	N21	W63	.924	15319	31.6	33D	1B	2	C		286		FDE
RAMY	05	1250	1318	1354	N21	W72	.969	15319	31.1	64	1B	3	C		113		DE
MCMA	05	1250E	1318	1345	N22	W70	.962	15319	31.3	55D	1N		C	1318	50	2.0	EK
MCMA	05	1250E	1331	1345	N22	W70	.962	15319	31.3	55D	1N		C	1331	60	2.4	EK
TEHR	05	1308	1312	1340	N21	W65	.936	15319	31.7	32	1B	3	C		222		
HTPR	06	1107		1141D	N18	E37	.693		9.2	34D	SF		C	1113	10	.1	
MCMA	06	1111	1117	1150	N18	E39	.714	15342	9.4	39	SF		C	1117	25	.4	D
HTPR	06	1217	1218	1220	N22	W80	.993		31.5	3	SF		C	1218	20		
PALE	07	1735	1736	1737	S27	W69	.930		2.6	2	SN	3	C		12		DE
RAMY	08	1110	1112	1126	N18	E77	.984		14.2	16	SN	3	C		15		
RAMY	10	1221	1222	1254	N15	W79	.988		4.6	33	SN	3	C		8		
RAMY	10	1253	1254	1300	S12	E23	.396		12.3	7	SN	3	C		32		
MCMA	10	1548	1559	1608	N16	E19	.491	15352	12.1	20	SN		C	1559	25	.3	DL

Hα SOLAR FLARES

JUNE 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE – JUN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
MANI	11	0204	0206	0214	N14	W50	.806		7.3	10	SF		P		40	.6	
MCMA	11	1052E		1115D	N17	E90	1.001	15360	18.2	23D	SN		C				
RAMY	11	1338	1339	1422	S32	E52	.815		15.5	44	SF	3	C		17		
PALE	12	0311	0315	0323	N16	W 2	.387		12.0	12	SN	3	C		134		FDE
RAMY	12	1136	1136	1224	N17	W 7	.417		12.0	48	SN	3	C		28		
RAMY	12	1254	1258	1316	N17	W 7	.417		12.0	22	SB	3	C		53		
RAMY	12	1637	1637	1720	N17	W 9	.427		12.0	43	SB	3	C		156		F
PALE	12	1818	1821	1834	N16	W10	.419		12.0	16	SB	3	C		88		FDE
PALE	12	1845	1846	1859	S33	E38	.694		15.6	14	SN	3	C		19		DE
PALE	12	1855	1859	1903	N16	W11	.425		12.0	8	SN	3	C		66		DE
PALE	12	2012	2012	2017	N16	W11	.425		12.0	5	SN	3	C		28		DE
PALE	12	2035	2042	2045	N16	W11	.425		12.0	10	SN	3	C		90		DE
PALE	12	2116	2121	2138	N16	W12	.432		12.0	22	SB	3	C		109		FDE
PALE	12	2239	2242	2250	N16	W13	.440		12.0	11	SB	3	C		109		FDE
PALE	12	2352	2357	0000	N16	W13	.440		12.0	8	SN	3	C		62		FDE
MANI	13	0136E	0137	0146D	N16	W16	.465		11.9	10D	SN		V		90	1.0	
PALE	13	0155	0156	0210D	N16	W15	.456		12.0	15D	SB	3	C		153		DE S
TEHR	13	0444	0452	0525	N17	W15	.469		12.1	41	SN	2	C		159		
BUCA	13	0706E		0717	N17	W19	.504		11.9	11D	SF		C	0706	43	.5	D
TEHR	13	0836E	0837	0853	N18	W20	.525		11.9	17D	SN	3	C		96		
TEHR	13	1112	1114	1125	N17	W22	.533		11.8	13	SB	2	C		64		
RAMY	13	1407E	1408	1410D	N16	W22	.522		11.9	3D	SB	3	C		21		F
RAMY	13	1505	1507	1517	N15	E58	.878		18.0	12	SN	3	C		28		F
MCMA	13	1515E		1522D	N17	E60	.898	15360	18.1	7D	SN		P	1515	60	1.3	E
RAMY	13	1510	1511	1518	N16	W23	.532		11.9	8	SB	3	C		38		F
MCMA	13	1515E		1522D	N17	W25	.563	15352	11.8	7D	SN		P	1517	60	.7	E
PALE	13	1716	1717	1720	N16	W24	.543		11.9	4	SB	3	C		47		DE
RAMY	13	1717	1718	1722	N16	W24	.543		11.9	5	SB	3	C		38		
MCMA	13	1720E	1720	1724	N17	W25	.563	15352	11.8	4D	SN		C	1720	25	.3	D
PALE	13	1737	1739	1750	N16	W24	.543		11.9	13	SB	3	C		50		DE
MCMA	13	1739	1740	1742D	N17	W25	.563	15352	11.9	3D	SB		C	1740	35	.4	D
PALE	13	1820	1821	1823	N15	W25	.544		11.9	3	SB	3	C		35		DE
RAMY	13	1858	1858	1909D	N16	W26	.564		11.8	11D	SB	3	C		38		F
MCMA	13	1900E		1902D	N17	W27	.584	15352	11.8	2D	SN		C	1900	25	.3	D
PALE	13	1919	1920	1930	N15	W26	.555		11.9	11	SB	3	C		140		HDE
PALE	13	2002	2004	2008	N15	W26	.555		11.9	6	SN	3	C		36		DE
RAMY	13	2016	2019	2053	N16	W26	.564		11.9	37	SB	3	C		72		
PALE	13	2018	2018	2053	N15	W26	.555		11.9	35	SB	3	C		114		HDE
RAMY	13	2121	2124	2145	N16	W26	.564		11.9	24	SB	3	C		190		
PALE	13	2121	2124	2141	N15	W27	.566	15352	11.9	20	1B	3	C		206		HDE
PALE	13	2218	2218	2223	N15	W27	.566		11.9	5	SN	3	C		38		HDE
PALE	13	2320	2320	2325	N15	W28	.577		11.9	5	SN	3	C		20		DE H
HTPR	14	0555	0559	0605	N17	W33	.648		11.8	10	SN		C	0559	60	.7	
TEHR	14	0731	0733	0740	N16	W35	.662		11.7	9	SB	2	C		32		
RAMY	14	1135	1136	1156	N16	W57	.873		10.2	21	SN	3	C		14		F
RAMY	14	1153	1200	1244	N14	E46	.768		17.9	51	SB	3	C		50		F
MCMA	14	1153	1202	1235	N16	E47	.786	15360	18.0	42	SN		C	1202	35	.5	E
RAMY	14	1209	1210	1236	N16	W57	.873		10.2	27	SN	3	C		25		
MCMA	14	1414	1415	1430	N17	W35	.669	15352	12.0	16	SN		C	1415	30	.4	D
RAMY	14	1615	1615	1627	N18	E55	.863		18.8	12	SN	3	C		56		
MCMA	14	1616	1618	1630	N17	E52	.835	15360	18.6	14	SF		C	1618	20	.4	D
MCMA	14	1721		1737D	N17	W37	.690	15352	11.9	16D	SN		C	1725	25	.4	OK
PALE	14	2003	2005	2027D	N19	E55	.866		19.0	24D	SN	3	C		60		FDE
MCMA	14	2008E		2022	N18	E51	.830	15360	18.7	14D	SB		C	2008	40	.7	E
MCMA	14	2008E		2018	N17	W38	.700	15352	12.0	10D	SF		C	2008	40	.6	E
PALE	15	0141	0143	0154	N15	W42	.731		11.9	13	SB	3	C		42		FDE
TEHR	15	0342E	0344	0351	N18	W43	.757		11.9	9D	SB	2	C		127		F
RAMY	15	1415	1423	1445	N16	W19	.494		14.2	30	SB	3	C		59		
RAMY	15	1628	1628	1637	N25	E 7	.538		16.2	9	SB	3	C		33		
MCMA	15	1759E		1930D	N17	W13	.455	15354	14.8	91D	SN		C	1820	50	.6	EK
MCMA	15	1906	1907	1915	N16	W52	.832	15352	11.9	9	SF		C	1907	25	.4	D
MCMA	15	2029	2033	2055	N26	E08	.555	15363	16.5	26	SN		C	2033	35	.4	E
RAMY	15	2031	2034	2041D	N25	E 4	.531		16.2	10D	SN	3	C		51		
PALE	16	0054	0055	0057	N18	W58	.886		11.7	3	SN	3	C		32		FDE
PALE	16	0057	0100	0104	N25	E 2	.529		16.2	7	SN	3	C		32		FDE
RAMY	16	1125	1126	1131	N16	W61	.903		11.9	6	SB	3	C		45		
RAMY	16	1143	1153	1202	N16	W62	.910		11.8	19	SB	3	C		40		

Hα SOLAR FLARES

JUNE 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS. CORD.	OBS. TYPE	MEASUREMENTS' TIME — UT	MEASUREMENTS' MEAS. AREA Mill. of Disk	MEASUREMENTS' CORR. AREA Sq. Deg.	REMARKS
	DATE JUN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY								
RAMY	16	1401	1405	1435D	N16	E20	.504		18.1	34D	SB	3	C		54		
RAMY	16	1525	1532	1545	S24	E64	.895		21.4	20	SB	3	C		32		
RAMY	16	1650	1651	1658	S24	E63	.888		21.4	8	SB	3	C		21		
MITK	16	2259E		2321	N13	W68	.942	15352	11.9	22D	1N		C	2259	170		E
MITK	17	0215	0225	0301	N17	E07	.421	15360	17.6	46	1N		C	0225	240	2.6	F
HTPR	17	1313	1317	1325	N30	E90	1.002		24.3	12	SF		C	1317	50		
RAMY	17	1548	1549	1553	N19	W21	.547		16.1	5	SN	3	C		26		F
RAMY	17	1826E	1836	1839D	N15	W41	.721		14.7	13D	SB	3	C		132		F
RAMY	17	1826E	1827	1830D	N15	W41	.721		14.7	4D	SB	3	C		68		F
MCMA	17	1835E		1858D	N15	W40	.711	15354	14.8	23D	1B		C	1840	130	2.0	E
PALE	17	2150	2152	2228D	N14	W44	.748	15354	14.6	38D	1B	3	C		181		DE F
MITK	18	0010	0027	0106	N18	E10	.451	15360	18.8	56	1N		C	0027	310	3.4	F
MANI	18	0011	0013	0032	N19	E10	.466		18.8	21	SN		P		100	1.1	F
PALE	18	0022	0022	0038	N18	E10	.451		18.8	16	SN	3	C		38		DE
PALE	18	0030	0033	0100	N14	W45	.758	15357	14.6	30	1B	3	C		133		DE
MANI	18	0033	0036	0040D	N15	W44	.753	15357	14.7	7D	1N		P		150	2.2	
PALE	18	0123	0123	0132	N14	W46	.768		14.6	9	SN	3	C		45		DE
MITK	18	0718	0742	0806	N26	W30	.694		16.1	48	SN		C	0742			E
BUCA	18	0720E		0800D	N25	W30	.686		16.1	40D	SN		C	0740	107	1.4	E
MCMA	18	1208	1210	1212D	N20	E06	.463	15360	19.0	4D	SB		C	1210	30	.3	D
RAMY	18	1637	1638	1656	N15	W53	.838		14.7	19	SB	2	C		49		F
MCMA	18	1650E		1700D	N17	W52	.836	15354	14.8	10D	SF		C	1650	50	.9	E
MITK	19	0354	0359	0422	N18	W05	.430		18.8	28	SN		C	0359			E
PALE	19	0355	0357	0404	N19	W 6	.448		18.7	9	SB	3	C		123		DE
TEHR	19	0400	0407	0414	N19	W 3	.441		18.9	14	SN	2	C		127		
TEHR	19	0400E	0407	0414	N19	W 3	.441		18.9	14D	SN	2	C		127		
MCMA	19	1550E	1551	1605D	N17	W21	.526	15360	18.1	15D	SN		C	1551	50	.6	E
MCMA	19	1816E		1830	N25	W50	.850	15354	16.0	14D	SF		P	1819	50	.9	E
PALE	19	1816	1816	1821	N25	W46	.819		16.3	5	SN	3	C		17		F
MITK	19	2336	2339	2356	N26	W53	.875		16.0	20	SB		C	2339			E
PALE	19	2337	2338	2343D	N25	W49	.842	15363	16.3	6D	1B	3	V		150		FDE
PALE	20	0045	0045	0052	N17	E69	.953		25.2	7	SN	3	C		24		FDE
HTPR	20	0807	0812	0814	N17	E66	.937		25.3	7	SN		C	0812	70	1.6	
HTPR	20	0813	0817	0819	S19	E90	.999		27.1	6	SF		C	0817	20		
HTPR	20	0839	0843	0845	N16	E66	.935		25.3	6	SF		C	0843	10	.2	
HTPR	20	0908	0912	0917	S19	E90	.999		27.1	9	SF		C	0912	10		
HTPR	20	0922	0924	0934	S19	E90	.999		27.1	12	SN		C	0924	50		
HTPR	20	1015	1020	1035	N12	W05	.336		20.1	20	SF		C	1020	30	.3	E
MCMA	20	1143	1152	1201	S20	E88	.997	15375	27.1	18	SN		C	1152			E
HTPR	20	1152	1153	1156	S19	E87	.996		27.0	4	SN		C	1153	30		
MCMA	20	1252	1258	1303	N16	E63	.917	15368	25.3	11	SN		C	1258	30	.7	EH
RAMY	20	1325	1327	1347	N26	E70	.968		25.8	22	SN	4	C		13		
MCMA	20	1330	1336	1400D	N16	E65	.929	15368	25.4	30D	SN		C	1336	50	1.2	E
MCMA	20	1355	1357	1420	S20	E15	.334	15365	21.7	25	SN		C	1357	35	.4	E
HTPR	20	1355	1356	1405	S29	E15	.441		21.7	10	SF		C	1356	40	.4	E
RAMY	20	1356	1358	1404	S30	E15	.453		21.7	8	SN	4	C		30		F
MCMA	20	1431	1435	1437	S20	E87	.996	15375	27.1	6	SN		C	1435			D
HTPR	20	1632	1634	1641	S19	E85	.993		27.1	9	SF		C	1634	20		
MCMA	20	1701	1709	1730	N25	E69	.963	15373	25.9	29	SN		C	1709	20	.6	D
HTPR	20	1703		1711D	N25	E74	.981		26.3	8D	SF		C	1708	10		
RAMY	20	1721	1726	1744	N18	E42	.748		23.9	23	SB	3	C		92		
MCMA	20	1722		1808D	N20	E51	.838	15368	24.5	46D	1B		C	1734	125	2.2	E
RAMY	20	1734	1735	1741	S17	E47	.730		24.3	7	SN	3	C		19		
MCMA	20	1734	1735	1743D	S18	E48	.743	15366	24.3	9D	SF		C	1735	30	.5	E
RAMY	20	1755	1758	1810	S19	E79	.976		26.7	15	SF	3	C		11		
MCMA	20	1908	1910	1917	S18	E47	.732	15366	24.3	9	SN		C	1910	15	.2	D
RAMY	20	1918	1928	1954	S19	E79	.976	15375	26.7	36	1B	2	C		99		
MCMA	20	1919	1928	1945	S19	E83	.988	15375	27.0	26	1N		C	1928			EU
PALE	20	1919	1928	1931D	S18	E78	.972	15374	26.7	12D	1N	3	V		88		DE
RAMY	20	2012	2015	2034	S19	E78	.972		26.7	22	SF	2	C		23		
MCMA	20	2150	2153	2201D	S18	E46	.721	15366	24.4	11D	SF		C	2153	15	.2	D
MCMA	20	2209	2212	2220D	S18	E82	.986	15375	27.1	11D	SN		C	2212			D
PALE	20	2210	2211	2218	S18	E76	.964		26.6	8	SN	3	C		13		F
PALE	20	2255	2255	2309	N18	W40	.728		18.0	14	SN	3	C		23		F
PALE	20	2337	2338	0008	N25	W49	.843	15358	17.3	31	1B	3	C		175		U F
MITK	21	0034E		0038	S17	E44	.695		24.3	4D	SF		C	0034			D
TEHR	21	0514E	0516	0526	S18	E71	.939		26.5	12D	SB	2	C		64		

Hα SOLAR FLARES

JUNE 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IM-POR-TANCE	OBS.		MEASUREMENTS'			REMARKS
	DATE JUN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
HTPR	21	0804	0808	0815	N16	E56	.866		25.5	11	SF		C	0808	30	.5	
HTPR	21	0925	0927	0931	N18	E52	.840		25.3	6	SF		C	0927	30	.5	
HTPR	21	1001	1005	1015	S17	E73	.950		26.9	14	SF		C	1005	20		
RAMY	21	1120	1442	1452	N11	W20	.452		20.0	212	SB	3	C		150		
RAMY	21	1200	1209	1332	S19	E66	.907		26.5	92	SB	3	C		47		
RAMY	21	1242	1242	1301	N16	E51	.824		25.4	19	SN	3	C		20		
HTPR	21	1306	1309	1319	S18	E37	.611		24.3	13	SN		C	1309	60	.7	EG
RAMY	21	1400	1541	1543D	S19	E66	.907	15366	26.5	103D	1B	3	V		200		
RAMY	21	1420	1442	1452	N11	W20	.452		20.1	32	SB	3	C		150		
HCMA	21	1442E		1453D	N12	W22	.485	15370	20.0	11D	SN		C	1442	75	.8	EK
HCMA	21	1534E	1538	1550D	S22	E73	.949	15375	27.1	16D	1B		C	1538	100	4.0	E
HTPR	21	1534	1539	1546	S22	E72	.944		27.0	12	SN		C	1539	130		
RAMY	21	1541E	1541	1612	S19	E66	.907	15366	26.6	31D	1B	3	C		200		
HCMA	21	1618	1622	1635	N20	E35	.692	15368	24.3	17	SF		C	1622	40	.6	E
HCMA	21	1715	1724	1731D	S16	E69	.927	15375	26.9	16D	SN		C	1724	25	.8	E
PALE	21	2155E	2155U	2234D	N11	W24	.499		20.1	39D	SB	3	C		162		FDE
MANI	22	0236E	0236U	0240D	S20	E67	.914		27.1	4D	SF		V		40	.9	F
PALE	22	0237E	0237U	0250D	S19	E63	.885		26.8	13D	SB	3	C		120		FDE
MANI	22	0243E	0245	0258	S20	E66	.907		27.1	15D	SN		V		90	1.9	F
HTPR	22	0519E	0532	0552	S26	W08	.349		21.6	33D	SF		C	0532	70		E
HTPR	22	0601	0604	0650	S26	W08	.349	15370	21.7	49	1N		C	0604	260	2.9	E
TEHR	22	0605E	0610	0629	S28	W 5	.366		21.9	24D	SB	1	C		190		FDE
HTPR	22	0843	0849	0900	N09	W27	.520		20.3	17	SF		C	0849	40	.4	
HTPR	22	1027	1030	1030	S23	E59	.855		26.9	3	SF		C	1030	40	.8	E
HTPR	22	1356		1404D	N32	E20	.688		24.1	8D	SF		C	1401	20	.2	E
RAMY	22	1600	1600	1612	N11	W35	.633		20.0	12	SB	3	C		19		
HTPR	22	1601		1609D	N12	W30	.579		20.4	8D	SF		C	1608	20	.2	
RAMY	22	1645	1745	2002D	N17	E16	.482	15368	23.9	197D	2N	3	C		992		FDE
RAMY	22	1645	1654	2002D	N17	E16	.482	15368	23.9	197D	1B	3	C		320		FDE
PALE	22	1734E	1805U	2240	N19	E17	.515	15368	24.0	306D	2B	3	C		550		U F
PALE	22	1940	1955	2101	S20	E54	.807	15375	26.9	81	1B	3	C		265		Z F
RAMY	22	1949	1953	1956D	S19	E53	.796	15375	26.8	7D	1B	3	C		188		
HCMA	22	2103E		2341D	N17	E16	.482	15368	24.1	158D	1F		C	2104	200	2.1	BFL
HCMA	22	2117	2130	2201D	N24	E37	.739	15373	25.7	44D	SB		C	2130	75	1.1	EL
PALE	22	2118	2130	2155	N27	E44	.814		26.2	37	SB	3	C		84		FDE
HCMA	22	2246	2251	2300	N18	E63	.921	15376	27.7	14	SB		C	2251	25	.6	D
PALE	22	2248	2251	2259	N21	E58	.895		27.3	11	SN	3	C		31		FDE
PALE	23	0104	0120	0125	N21	E57	.888		27.3	21	SN	3	C		34		FDE
BUCA	23	0744E	0749	0830D	N25	E30	.687	15373	25.6	46D	1B		C	0749	322	4.1	GE
ISTA	23	0745		0800	N26	E31	.704		25.6	15	SN						E
TEHR	23	0749E	0801	0808	S24	E38	.644	15315	26.2	19D	1B	2	C		222		FDE
HCMA	23	1043	1050	1102	N13	W46	.765	15370	20.0	19	SN		C	1050	70	1.0	E
HCMA	23	1132	1135	1154	S28	W24	.513	15365	21.7	22	SN		C	1135	30	.4	E
HCMA	23	1143	1146	1154	N24	E29	.670	15373	25.7	11	SN		C	1146	30	.4	E
RAMY	23	1206	1207	1215	N23	E56	.887		27.7	9	SN	3	C		21		
HCMA	23	1210	1214	1220	N23	E57	.893	15376	27.8	10	SN		C	1214	40	.8	EK
RAMY	23	1234	1234	1239	N23	E56	.887		27.7	5	SN	3	C		16		
HCMA	23	1318	1323	1348	N23	E53	.865	15376	27.5	30	SB		C	1323	60	1.1	E
RAMY	23	1328	1328	1340	N23	E55	.880		27.7	12	SN	3	C		18		
HCMA	23	1328	1340	1404D	N23	E27	.643	15373	25.6	36D	SB		C	1340	90	1.1	E
RAMY	23	1331	1337	1401	N25	E31	.695		25.9	30	SB	3	C		56		
HTPR	23	1346E		1401	N24	E27	.653		25.6	15D	SF		C	1348	50	.5	E
HTPR	23	1416		1422D	S28	W26	.534		21.6	6D	SN		C	1419	120	1.4	E
RAMY	23	1417	1418	1426	S27	W24	.504		21.8	9	SB	3	C		62		
RAMY	23	1619	1620	1625	N25	E28	.671		25.8	6	SN	3	C		22		
RAMY	23	1624	1627	1636	N27	E57	.905		28.0	12	SN	3	C		18		
RAMY	23	1731	1735	1748	N25	E27	.662		25.8	17	SB	3	C		111		F
HCMA	23	1732	1736	1757	N25	E26	.654	15373	25.7	25	SB		C	1736	130	1.7	E
PALE	23	1733	1735	1740D	N27	E27	.682		25.8	7D	SB	3	C		120		FDE
PALE	23	2215	2216	2218	S21	E39	.645		26.9	3	SN	3	C		23		F
PALE	23	2305	2309	2322	S20	E38	.629		26.8	17	SN	3	C		51		F
PALE	24	0008	0009	0021	S20	E38	.629		26.9	13	SN	3	C		56		F
HTPR	24	0950		0953D	N25	E48	.836		28.0	3D	SF		C	0952	20	.3	E
HTPR	24	1015	1019	1028	N20	W05	.463		24.1	13	SF		C	1019	20	.2	
HCMA	24	1036	1039	1105	N25	E49	.843	15376	28.1	29	SB		C	1039	20	.3	D
HTPR	24	1038	1042	1100	N25	E47	.828		28.0	22	SF		C	1042	20	.3	
RAMY	24	1205	1208	1223	S20	E30	.527		26.8	18	SB	4	C		43		H
HCMA	24	1207	1208	1211	S24	E34	.597	15375	27.1	4	SB		C	1208	20	.3	D
HTPR	24	1208	1208	1209	S23	E35	.604		27.1	1	SN		C	1208	30	.4	

Hα SOLAR FLARES

JUNE 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IM-POR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA mil. of Dia.	CORR. AREA Sq. Deg.	
RAMY	24	1249	1259	1314	N17	W 8	.429		23.9	25	SB	4	C		60		
RAMY	24	1253	1324	1404	S20	E29	.514		26.7	71	SB	4	C		88		FDE
HTPR	24	1320	1329	1350	S22	E33	.575		27.0	30	SN		C	1329	70	.8	E
TEHR	24	1321E	1325	1357	S21	E34	.583		27.1	36D	SB	2	C		95		F
MCMA	24	1321	1332	1410D	S23	E33	.580	15375	27.0	49D	SN		C	1332	70	.9	E
RAMY	24	1413	1414	1522	N16	W87	1.000		18.1	69	SB	4	C		0		
RAMY	24	1413	1437	1522	N16	W87	1.000		18.1	69	SN	4	C		0		
TEHR	24	1414E	1416	1417D	N20	W88	1.000		18.0	3D	SN	2	V		64		
HTPR	24	1528	1531	1539	N28	E21	.650		26.2	11	SF		C	1531	20	.2	
MCMA	24	1529	1531	1538D	N28	E21	.650	15373	26.2	9D	SN		C	1531	40	.5	E
RAMY	24	1530	1531	1536	N25	E15	.578		25.8	6	SB	4	C		27		
RAMY	24	1542	1547	1608	N17	W10	.440		23.9	26	SN	3	C		31		
RAMY	24	1733	1734	1756	S20	E27	.487		26.8	23	SN	3	C		22		
PALE	24	2042	2043	2050	S20	E25	.461		26.7	8	SN	3	C		26		F
BUCA	25	0805E		0825	N28	E12	.602		26.2	20D	SF		C	0808	31	.4	
MCMA	25	1337	1342	1405D	N22	E28	.643	15376	27.7	28D	SN		C	1342	60	.7	E
BUCA	26	0820E		0840D	S16	E07	.194		26.9	20D	SF		C	0830	63	.7	E
MCMA	26	1453E		1456D	S17	W04	.184	15375	26.3	3D	SN		P	1453	40	.5	EH
MCMA	26	2036E		2040D	S17	W07	.207	15375	26.3	4D	SN		P	2036	40	.5	EH
HTPR	27	0658	0705	0720	N26	E10	.568		28.0	22	SF		C	0705	20	.2	
HTPR	27	0807	0809	0823	S17	W05	.190		27.0	16	SF		C	0809	20	.2	E
BUCA	27	0810E		0827	S17	W04	.183		27.0	17D	SF		C	0817	23	.3	E
BUCA	27	0822		0847	N22	E07	.500		27.9	25	SN		C	0825	19	.2	
HTPR	27	0838	0840	0852	N18	W40	.729		24.4	14	SN		C	0840	70	.9	E
BUCA	27	0840		0856D	N20	W41	.751		24.3	16D	SN		C	0845	31	.4	
ISTA	27	0843		0853	N15	W42	.733		24.2	10	SF						E
HTPR	27	1001	1003	1017	N15	E69	.950	15381	4.6	16	1N		C	1003	100	2.4	E
MCMA	27	1101	1107	1125D	N14	E70	.954	15381	4.7	24D	SF		C	1107	40	1.2	E
MCMA	27	1105	1107	1115	N25	E07	.543	15376	28.0	10	SN		C	1107	35	.4	E
HTPR	27	1110	1140	1200	S17	W16	.316		26.3	50	SN		C	1140	80	.8	EK
MCMA	27	1112	1145	1240	S18	W14	.299	15375	26.4	88	SB		C	1145	120	1.3	EK
MCMA	27	1130	1132	1145D	N25	E07	.543	15376	28.0	15D	SF		C	1132	30	.3	D
HTPR	27	1147	1151	1200	N22	E04	.492		27.8	13	SN		C	1151	60	.6	E
MCMA	27	1148	1152	1205	N23	E04	.507	15376	27.8	17	SB		C	1152	50	.6	E
MCMA	27	1159	1201	1205	N20	E90	1.001	15382	6.2	6	SN		C	1201			
HTPR	27	1242	1243	1254	N14	E67	.938		4.6	12	SF		C	1243	30	.7	E
MCMA	27	1244	1245	1254	N14	E70	.954	15381	4.8	10	SN		C	1245	40	1.2	E
MCMA	27	1340E		1410D	N20	E79	.991	15381	5.5	30D	SN		C	1350			EKLY
HTPR	27	1358	1400	1408	N17	W30	.619		25.3	10	SF		C	1400	30	.3	E
MCMA	27	1916	1921	1930D	N14	E66	.932	15381	4.8	14D	SN		C	1921	50	1.3	D
MCMA	27	1921	1924	1930	S17	W13	.276	15375	26.8	9	SB		C	1924	80	.9	EH
MCMA	27	1922	1927	1933	N27	E04	.565	15376	28.1	11	SN		C	1927	25	.3	D
PALE	28	0248E	0248	0252D	S20	W16	.344	15375	26.9	4D	2B	3	V		570		FDE
TEHR	28	0252E	0256	0314	S20	W15	.332		27.0	22D	SB	2	C		127		F
HTPR	28	0748	0751	0800	S23	W24	.469		26.5	12	SF		C	0751	50	.5	E
HTPR	28	0840	0842	0850	N14	E58	.877		4.7	10	SF		C	0842	40	.8	E
HTPR	28	1046	1053	1115	S18	W43	.685		25.2	29	SF		C	1053	60	.8	
MCMA	28	1049	1053	1130D	S18	W45	.708	15374	25.1	41D	SN		C	1053	40	.6	EL
MCMA	28	1125	1136	1215	N23	W08	.518	15376	27.9	50	SN		C	1136	45	.5	E
MCMA	28	1305	1312	1324	S23	W27	.506	15375	26.5	19	SN		C	1312	50	.6	E
TEHR	28	1306E	1312	1318	S19	W28	.495		26.4	12D	SB	2	C		64		F
HTPR	28	1308	1311	1322	S23	W27	.506		26.5	14	SF		C	1311	40	.4	E
RAMY	28	1309	1311	1324	S19	W22	.413		26.9	15	SB	4	C		36		F
HTPR	28	1533	1533	1538	N27	W07	.572		28.1	5	SF		C	1533	60	.7	E
MCMA	28	1535	1540	1600D	N19	W11	.475	15368	27.8	25D	SN		C	1540	50	.7	D
RAMY	28	1535	1538	1601	N17	W41	.734		25.6	26	SB	3	C		25		
RAMY	28	1546	1552	1557	S15	E67	.913		5.7	11	SF	3	C		13		
RAMY	28	1551	1552	1606	N17	E48	.801		4.3	15	SN	3	C		63		
MCMA	28	1551	1552	1601	N15	E52	.830	15381	4.6	10	SN		C	1552	50	.9	EL
RAMY	28	1614	1614	1627	N17	W42	.744		25.5	13	SN	3	C		18		
RAMY	28	1615	1615	1621	N17	E48	.801		4.3	6	SN	3	C		16		
RAMY	28	1636	1656	1710	N17	W42	.744		25.5	34	SB	3	C		76		
MCMA	28	1643	1655	1714	N15	W48	.793	15368	25.1	31	SB		C	1655	80	1.3	E
HTPR	28	1645	1652	1708	N14	W45	.760		25.3	23	SN		C	1652	80	1.1	E
HTPR	28	1720	1722	1735	S20	W25	.460		26.8	15	SF		C	1722	60	.7	EK
RAMY	28	1720	1723	1747	S19	W25	.454		26.8	27	SB	3	C		57		F
HTPR	28	1800	1808	1818	N27	W08	.575		28.2	18	SF		C	1808	20	.2	E
MCMA	28	1850E	1852	1905	N15	W49	.803	15368	25.1	15D	SB		C	1852	50	.8	D

Hα SOLAR FLARES

JUNE 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE - JUN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			CORD.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
PALE	28	1853E	1854U	1902D	N16	W46	.778		25.3	9D	SN	3	C		55		U F
MCMA	28	1912	1914	1928	N26	W18	.568	15376	28.1	16	SN		C	1914	60	.7	E
MCMA	28	1955	2010	2030D	S31	E23	.531	15377	2.6	35D	SF		C	2010	40	.5	E
MCMA	28	2018	2026	2033	N27	W09	.578	15376	28.2	15	SN		C	2026	70	.8	E
MCMA	28	2020	2027	2038D	N15	E49	.803	15381	4.5	18D	SN		C	2027	90	1.4	E
MCMA	28	2108		2125D	N15	E48	.793	15381	4.5	17D	SB		C	2122	100	1.5	EU
TEHR	29	0240E	0244	0258	S20	W29	.513		26.9	18D	SB	2	C		159		F
MANI	29	0335E	0335U	0350	S16	W31	.523		26.8	15D	SN		P		80	1.0	U
TEHR	29	0340E	0344	0358	S20	W29	.513		27.0	18D	SB	2	C		159		F
MANI	29	0432E	0434	0449	N26	W14	.586		28.1	17D	SF		P		40	.4	
TEHR	29	0434E	0442	0448	N22	W17	.554		27.9	14D	SB	2	C		95		DE
MANI	29	0501	0501	0508	N26	W14	.586		28.2	7	SF		P		20	.2	F
HTPR	29	0522	0537	0553	N17	W51	.828		25.4	31	SF		C	0537	30	.5	EK
HTPR	29	0546	0549	0552	S17	W37	.607		26.5	6	SF		C	0549	10	.1	
HTPR	29	0826	0828	0835	S18	W40	.648		26.4	9	SF		C	0828	20	.3	
HTPR	29	0835	0836	0847	N16	E34	.655		3.9	12	SF		C	0836	30	.3	E
HTPR	29	0953	0955	1005	N20	E90	1.001		8.2	12	SN		C	0955	60		
MONT	29	0953E	1005	1021	N18	E90	1.001		8.2	28D	SN		C	1005	70		
HTPR	29	1030	1031	1045	N17	W60	.899		24.9	15	SF		C	1031	20	.4	
RAMY	29	1134	1141	1154	N16	E36	.676		4.2	20	SN	3	C		26		
RAMY	29	1152	1210	1301	S19	W35	.587		26.9	69	SB	3	C		82		
HTPR	29	1209	1211	1220	S21	W41	.668		26.4	11	SF		C	1211	20	.3	
HTPR	29	1215	1217	1222	N26	W19	.616		28.1	7	SF		C	1217	10	.1	
MCMA	29	1216	1218	1223	N27	W20	.634	15376	28.0	7	SN		C	1218	25	.3	E
RAMY	29	1216	1216	1224	N23	W22	.603		27.9	8	SB	3	C		22		
HTPR	29	1218	1221	1225	S18	W38	.623		26.7	7	SF		C	1221	10	.1	
RAMY	29	1230	1232	1235	N15	W55	.856		25.4	5	SN	3	C		16		F
RAMY	29	1414	1417	1432	N25	W20	.611		28.1	18	SB	3	C		157		
HTPR	29	1414	1417	1430	N27	W20	.634		28.1	16	SB		C	1417	180	2.0	E
MCMA	29	1414	1416	1435	N26	W21	.629	15376	28.0	21	SB		C	1416	100	1.3	EH
TEHR	29	1415E	1420	1431	N24	W22	.614		27.9	16D	SB	2	C		127		
MCMA	29	1542	1543	1550	S22	W43	.694	15375	26.4	8	SN		C	1543	40	.6	E
MCMA	29	1600	1610	1640D	S16	E55	.813	15384	5.8	40D	SF		C	1610	70	1.3	E
RAMY	29	1607	1608	1622	S15	E54	.803		5.7	15	SN	3	C		22		F
RAMY	29	1636	1637	1647	N16	E33	.644		4.2	11	SN	3	C		25		F
MCMA	29	1816E		1841D	N15	E38	.691	15381	4.6	25D	SB		C	1830	80	1.1	E
PALE	29	1817	1820	1844	N16	E32	.633		4.2	27	SB	3	C		103		U F
PALE	29	1831	1835	1838	N22	W27	.635		27.7	7	SN	3	C		25		DE
PALE	29	1901	1901	1912	N16	E32	.633		4.2	11	SN	3	C		26		DE
MCMA	29	1901E		2005D	N15	E35	.659	15381	4.4	64D	SN		C	1914	125	1.7	E
PALE	29	1913E	1915	1940	N19	W67	.945		24.8	27D	SF	3	C		95		FDE
PALE	29	1920	1923	1945	N16	E26	.569		3.8	25	SN	3	C		36		DE
PALE	29	2134	2146	2153	N22	W29	.653		27.7	19	SN	3	C		27		DE
PALE	29	2134	2155	2155	N16	W61	.904		25.3	21	SN	3	C		27		FDE
PALE	29	2206	2214	2232	N25	W25	.648	15376	28.0	26	1B	3	C		206		UDE
PALE	29	2217	2217	2221	N22	E51	.847		5.8	4	SN	3	C		26		FDE
PALE	29	2226	2233	2236D	N16	W61	.904	15368	25.4	10D	1B	3	V		131		FDE
PALE	30	0123	0123	0125	N16	W63	.917		25.3	2	SN	3	C		16		F
MITK	30	0153E	0202	0230	N18	W61	.908	15368	25.5	37D	1F		C	0202	110	2.4	E
PALE	30	0215	0237	0301	N16	W64	.924		25.3	46	SB	3	C		105		F
TEHR	30	0215E	0219	0255	N17	W58	.885		25.7	40D	SN	2	C		127		
PALE	30	0236	0236	0250	N22	W31	.671		27.8	14	SN	3	C		27		F
MONT	30	0745	0751	0805	N21	W29	.644		28.1	20	SN		C	0751	80		EH
TEHR	30	1052	1054	1112	N18	E18	.513		3.8	20	SB	2	C		190		F
MCMA	30	1052	1053	1113	N17	E18	.501	15381	3.8	21	SB		C	1053	80	.9	E
MCMA	30	1146	1149	1159D	N19	E31	.646	15381	4.8	13D	SB		C	1149	60	.8	E
RAMY	30	1152	1153	1156D	N16	E22	.527		4.1	4D	SN	2	C		29		
MCMA	30	1254	1258	1304	N25	W35	.730	15376	27.9	10	SN		C	1258	50	.7	E
RAMY	30	1254	1257	1303	N23	W36	.724		27.8	9	SB	3	C		62		
MCMA	30	1331	1338	1355	N19	E32	.656	15381	5.0	24	SB		C	1338	60	.8	E
TEHR	30	1334E	1336	1342	N20	E25	.597		4.4	8D	SN	2	C		64		F
RAMY	30	1336	1337	1350	N19	E30	.636		4.8	14	SB	3	C		95		
RAMY	30	1411	1411	1427	N19	E31	.646		4.9	16	SN	3	C		20		
RAMY	30	1445	1450	1525	N17	W68	.948	15368	25.5	40	1B	3	C		206		FDE
MCMA	30	1448	1450	1516D	N18	W68	.949	15368	25.5	28D	1B		C	1450	125	3.7	E
RAMY	30	1527	1544	1603	S15	E41	.655		5.7	36	SB	3	C		148		
MCMA	30	1631E		1635D	N27	W35	.745	15376	28.1	4D	SN		P	1631	20	.3	D
MCMA	30	1704E		1718D	N27	W36	.753	15376	28.0	14D	SB		P	1704	50	.7	E
PALE	30	1706E	1710	1711D	N25	W36	.738	15376	28.0	5D	1B	3	C		182		U F
PALE	30	1709E	1713	1719	N18	E28	.608		4.8	10D	SN	3	C		34		DE

Hα SOLAR FLARES

JUNE 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION — MIN.	IM-POR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COND.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
PALE	30	1815E	1846U	1846D	N22	W41	.762		27.7	31D	SN	3	C		58		DE
RAMY	30	1838	1845	1903	N20	E78	.989		8.6	25	SB	3	C		76		F
PALE	30	1848	1849	1857D	N19	E72	.969		8.2	9D	SB	3	C		41		FDE
RAMY	30	1919	1921	1930	N23	W39	.751		27.9	11	SB	3	C		60		
PALE	30	2107E	2107U	2117	N22	W42	.771		27.7	10D	SN	3	C		40		DE
PALE	30	2118E	2118U	2127D	N15	E15	.450		4.0	9D	SN	3	C		32		DE
PALE	30	2146E	2148U	2150D	N15	E15	.450		4.0	4D	SN	3	C		20		DE
PALE	30	2345	2353	0010	N22	W30	.662		28.7	25	SN	3	C		64		FDE

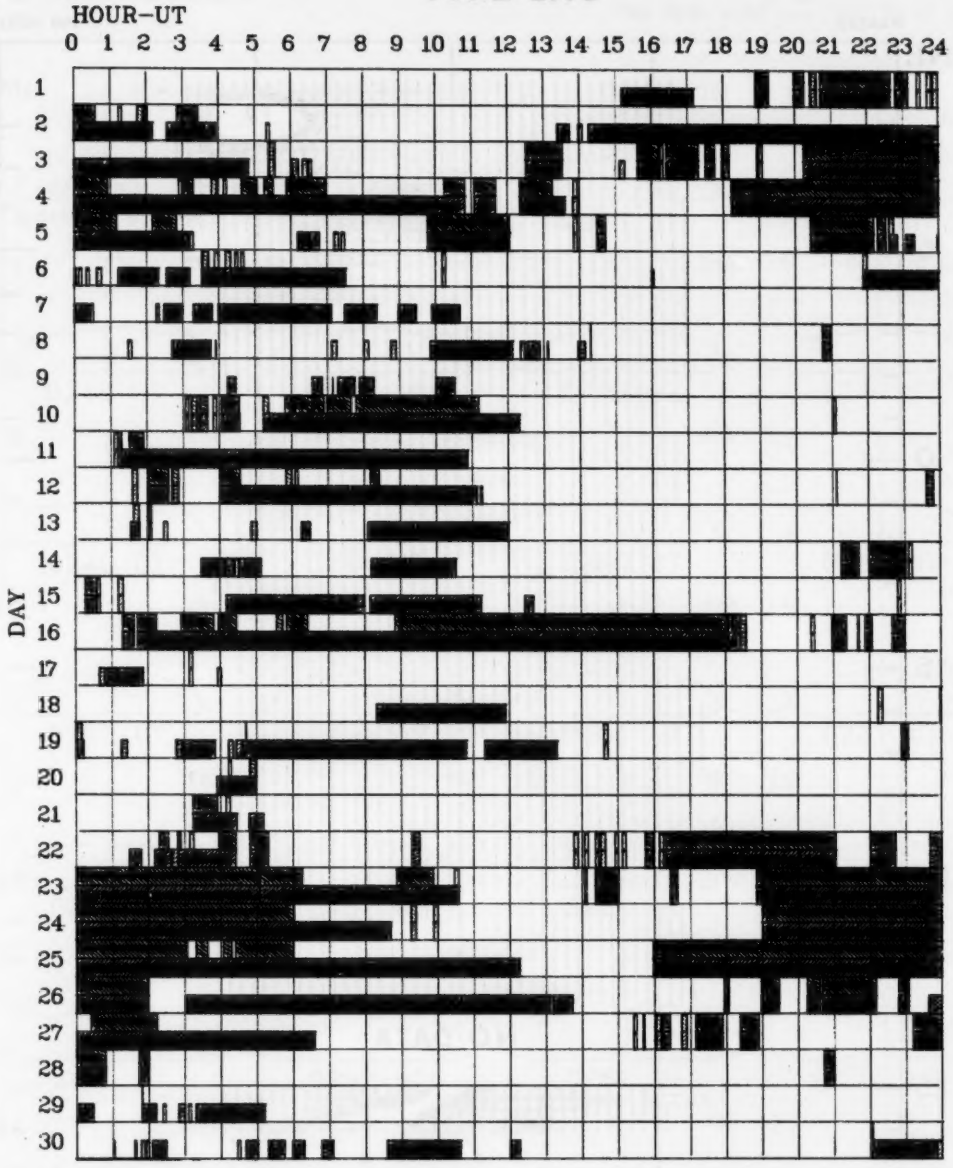
; "Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

JUNE 1978



Observatories included in total patrol:

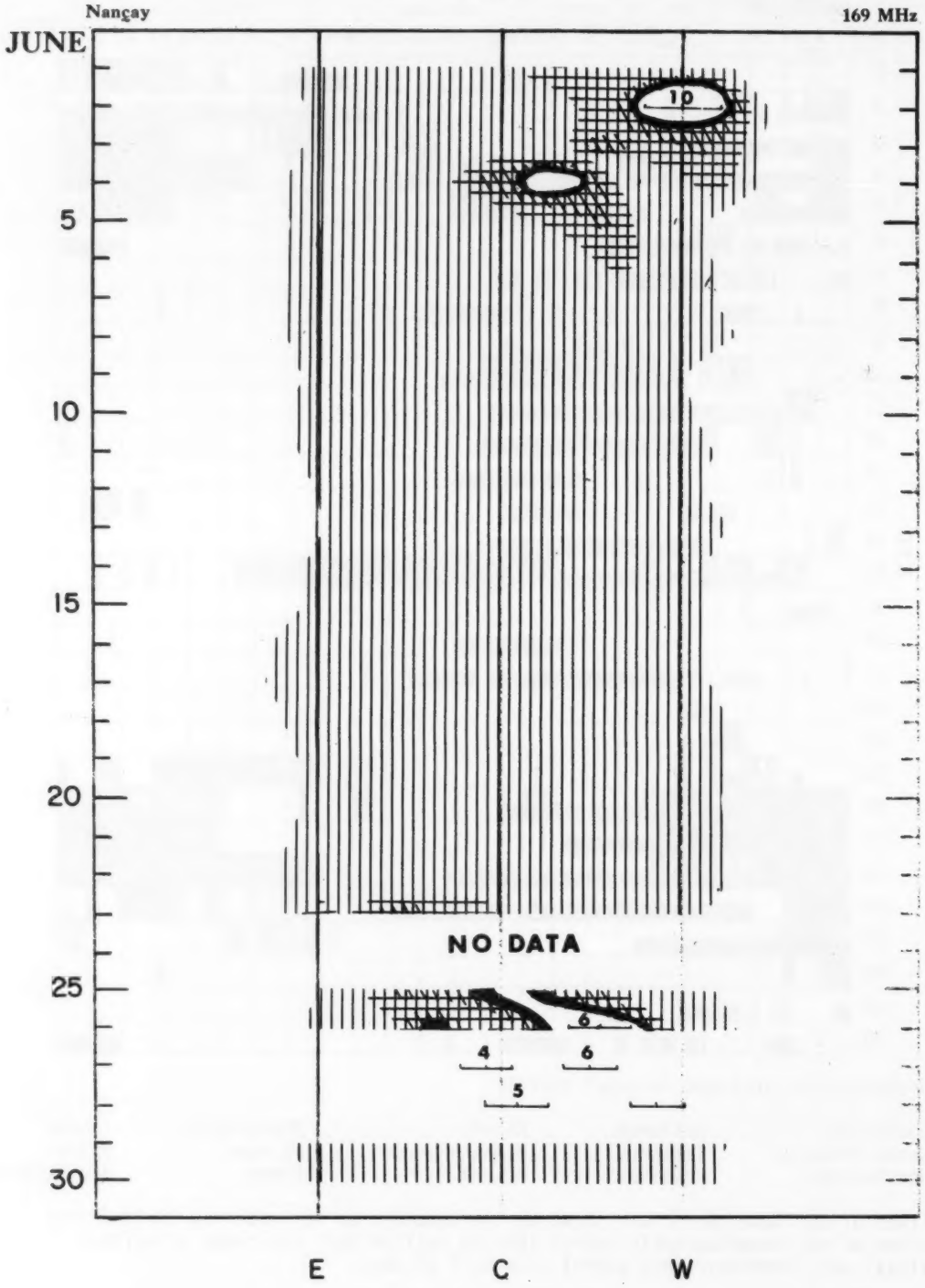
Bucharest	Holloman	Manila	Monte Mario	Tehran
Haute Provence	Istanboul	McMath-Hulbert	Palehua	Upice
Herstmonceux	Kodaikanal	Mitaka	Ramey	Wendelstein

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

20
Jun 78

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

JUNE 1978

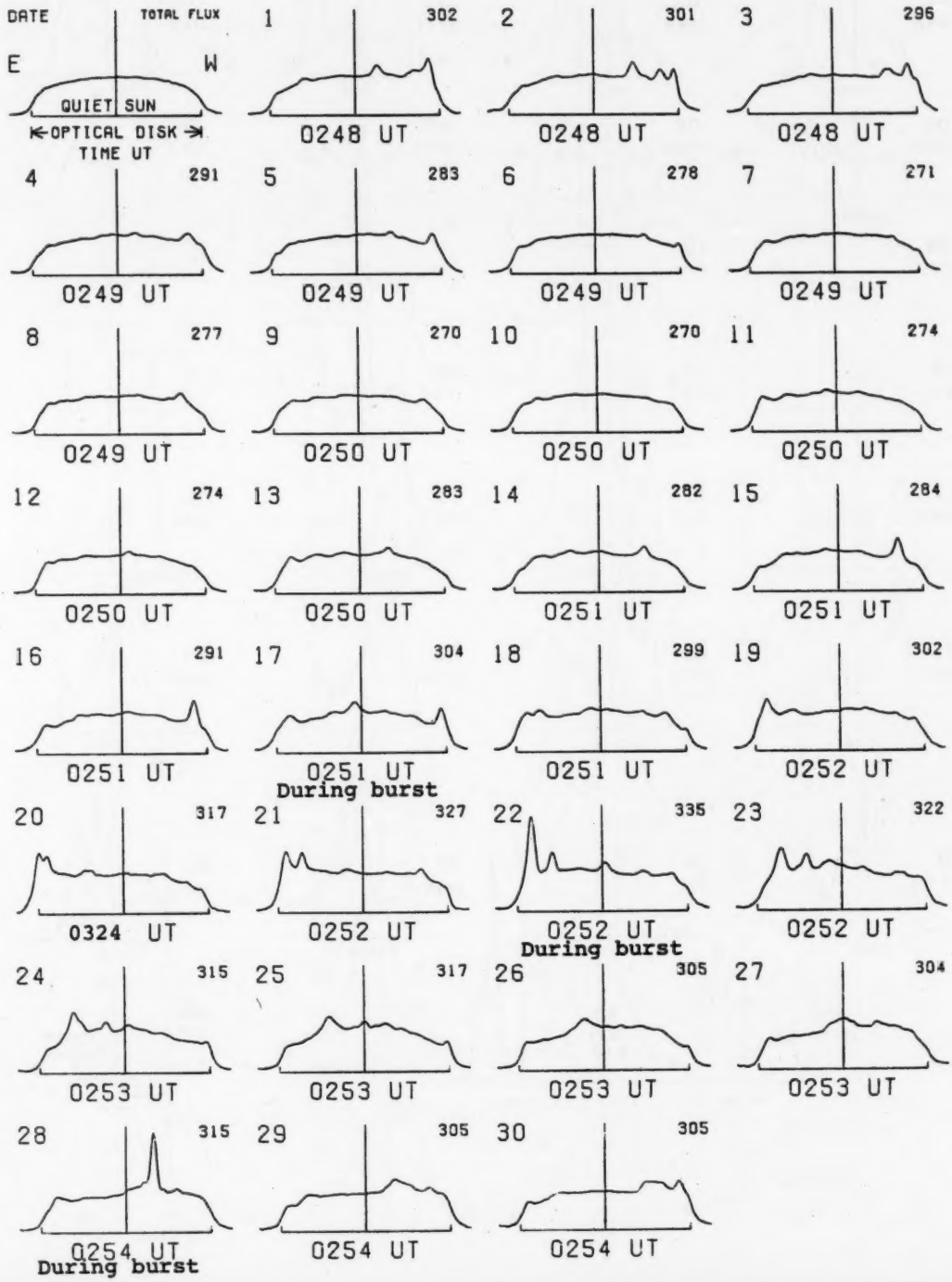


EAST-WEST SOLAR SCANS

JUNE 1978

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC



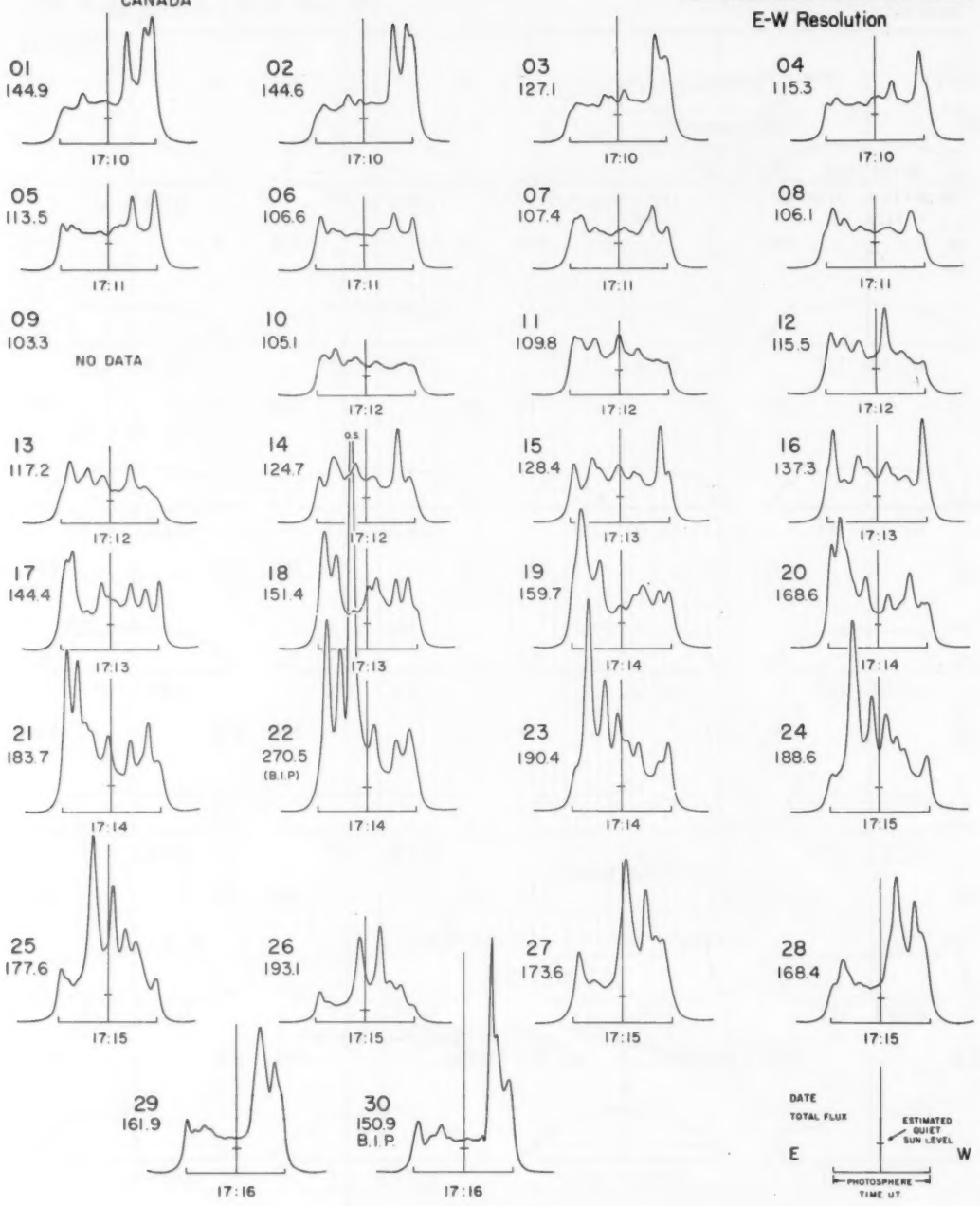
22
Jun 78

EAST-WEST SOLAR SCANS

JUNE 1978

ALGONQUIN RADIO OBSERVATORY
CANADA

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution

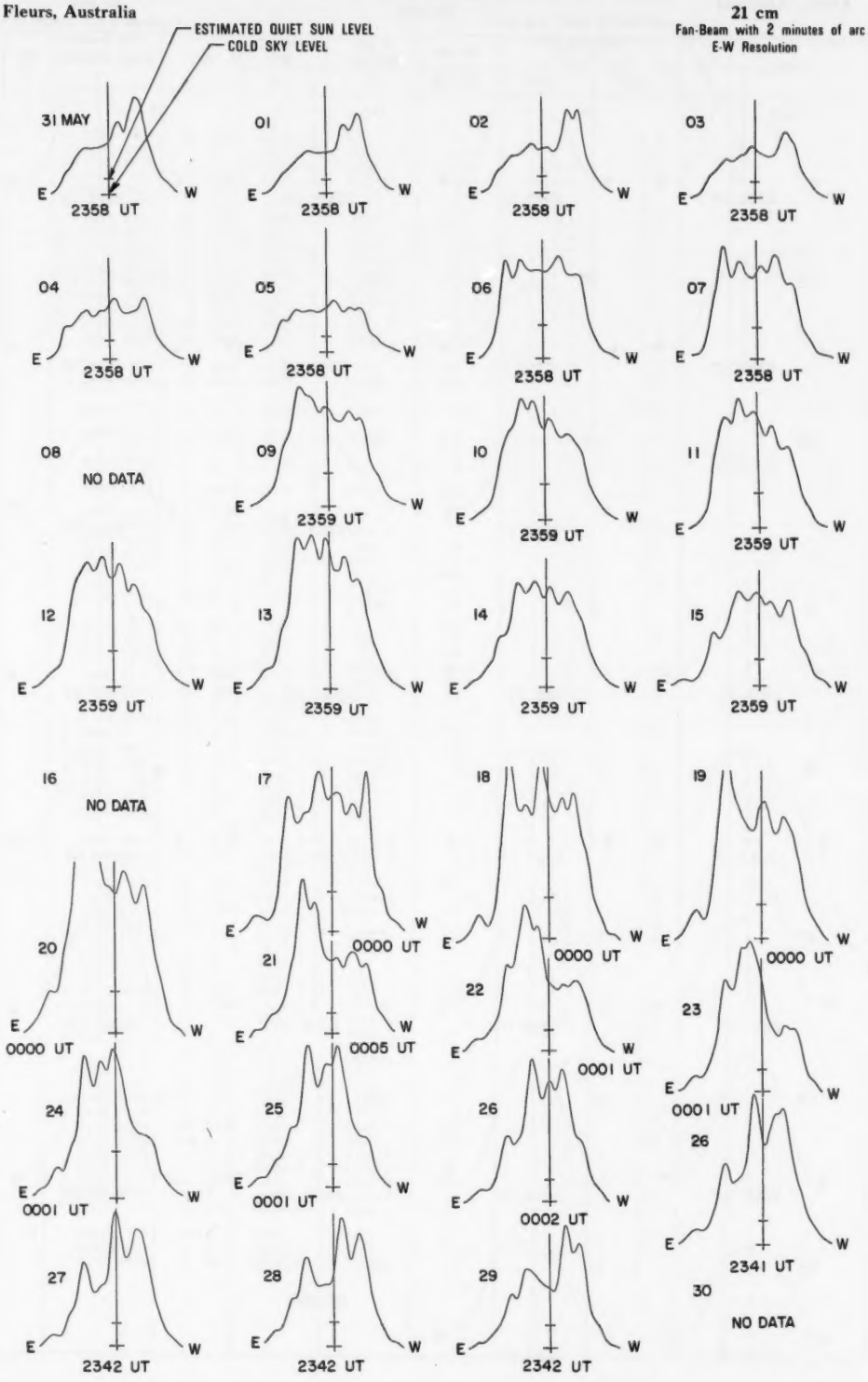


EAST-WEST SOLAR SCANS

JUNE 1978

Fleurs, Australia

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution

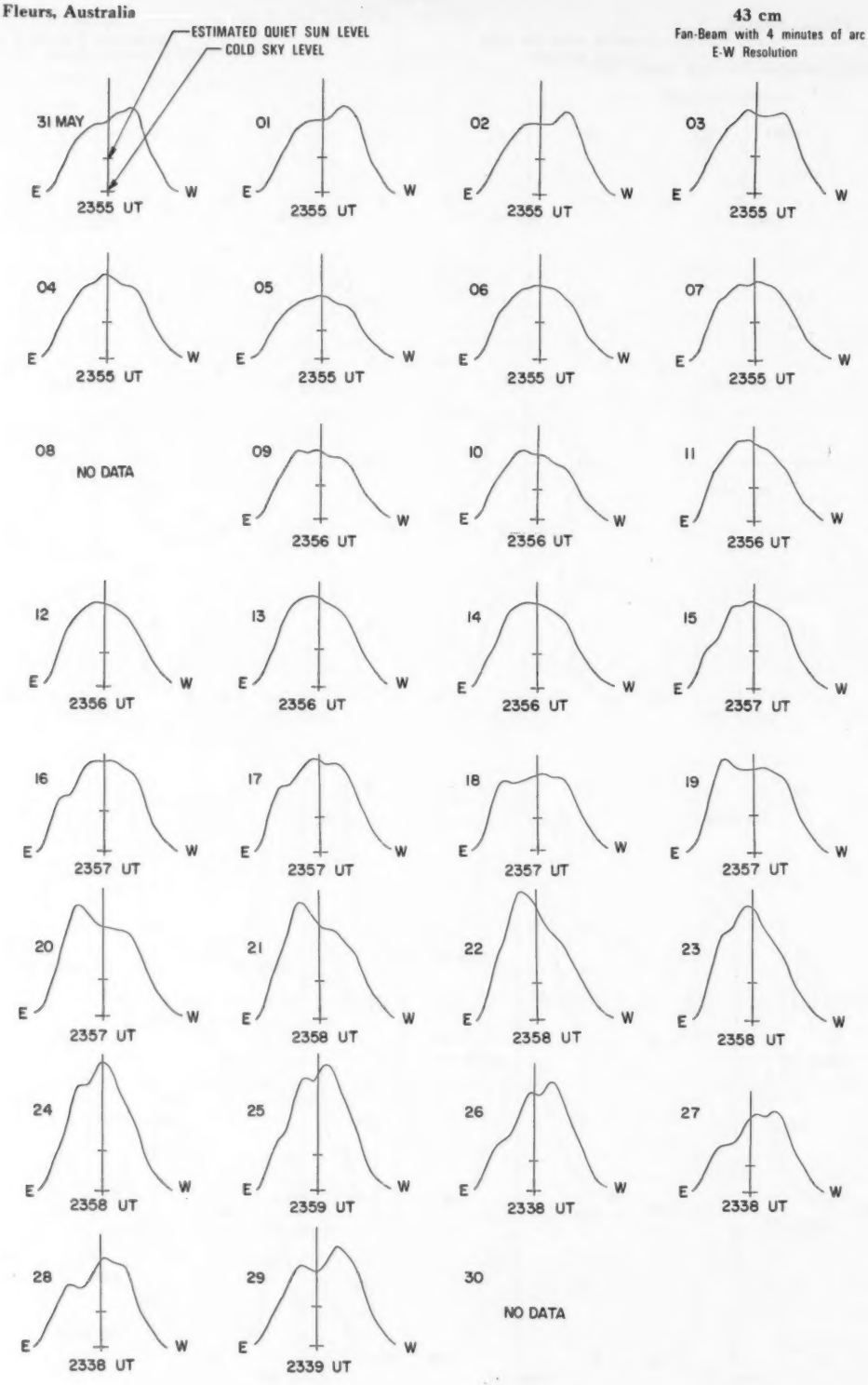


EAST-WEST SOLAR SCANS

JUNE 1978

Fleurs, Australia

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JUNE 1978

JUN 1978	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22}Wm^{-2}Hz^{-1}$		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
1	2800	OTTA	21 GRF	1324		34	2.8	1.4		
	2800	OTTA	1 S	1325.3	1326	1.5	3	1.5		
	8800	SGMR	3 S	1325.9	1329	5.1	25.3	10.1		
	2695	SGMR	3 S	1326	1328.5	4.5	19.5	7.8		
	2695	BOUL	4 SF	1328	1329	2.5	13	4		
	2800	OTTA	3 S	1328	1328.7	2.5	15	5		
	2800	OTTA	22 GRF	1415	1514	115	4.2	2.1		
	2800	OTTA	21 GRF	2100	2118	78	3.6	1.4		
	8800	SGMR	3 S	2101.5	2104	3.5	12.6	5		2,5,SWF
	2695	SGMR	3 S	2102	2103.5	7	37.8	15.1		2,5,SWF
	2695	BCUL	46 C	2102	2104	13.5	27	9		
	2695	BOUL	29 PBI	2116	2119.5	5	3	1		
	2800	CTTA	4 S/F	2102	2102.4	7	32	10.5		
	2800	OTTA	1 S	2111	2113.2	4.5	5.8	2.9		
	2800	OTTA	20 GRF	2210	2225	60	2.8	1.4		
	2695	PENT	20 GRF	2336	2340	24	3.4	1.7		
2	2800	OTTA	20 GRF	1425	1500	60	2.2	1.7		
	2800	OTTA	20 GRF	1620	1915	280	5.6	2.8		
3	2800	OTTA	1 S	2212.5	2214	2.5	2.4	1.4		
5	2800	OTTA	22 GRF	1240	1325	110	3.4	1.7		
7	2800	OTTA	1 S	1851	1852	2	1	.5		
8	2800	OTTA	20 GRF	1820	2005	170	2	1		
12	2800	OTTA	20 GRF	1240	1317	85	3.2	1.6		
	2800	OTTA	2 S/F	1636	1637.7	6	8	2.7		
	2800	OTTA	29 PBI	1642	1642	60	2.8	1.4		
	2695	SGMR	1 S	1636.5	2637.7	5.8	7.5	3		SWF
	2800	OTTA	21 GRF	2030	2125	110	2.6	1.4		
	2800	OTTA	1 S	2120	2120.8	2	2	.8		
	2695	PENT	240 R	2350	2500	70	3.6	2		
13	2800	OTTA	27 RF	1218		152	1.2	1.1		
	2800	OTTA	24 R	1218	1230	12	1.2	.6		
	2800	OTTA	24P R	1230		128	1.2			
	2800	OTTA	26 FAL	1438	1450	12	-1.2	-.6		
	2800	OTTA	20 GRF	1454	1605	95	1.6	.8		
	2800	OTTA	20 GRF	1640	1645	25	1	.5		
	2800	OTTA	8 S	1717.8	1718	.4	1.6			
	2800	OTTA	23 GRF	1900	2035	170	3.8	1.9		
	2800	OTTA	1 S	1908.5	1909.1	1.5	.8	.4		
	2800	OTTA	40 F	1918.8	1919.5	3	1.4			
	2695	BOUL	4 SF	1919	1920.5	3	12	4		
	8800	SGMR	3 S	2122.5	2122.7	1	18.6	7.4		SWF
	2695	SGMR	3 S	2122.7	2123.1	1.3	25.5	10.2		SWF
	2800	OTTA	4 S/F	2122.8	2123	1.2	22	6		
	2695	BOUL	8 S	2123.5	2124	1.5	18	6		
14	2695	PENT	1 S	0046.2	0046.9	1	2.6	1.3		
	2695	PENT	2 S/F	0129	0129.8	1.2	4			
	2695	BOUL	1 S	0130	0131	1	4	1		
	2800	OTTA	21 GRF	1100	1220	150	3.4	1.6		
	2800	OTTA	8 S	1235.5	1235.6	.5	1.8	.6		
	2800	OTTA	20 GRF	1405	1415	25	1.8	.9		
	2800	OTTA	27A RF	1500		180	2.2	1.8		
	2800	OTTA	24 R	1500	1550	50	2.2	1.1		
	2695	BOUL	1 S	1543.5	1544	.5	2	1		
	2800	OTTA	24P R	1550		110	2.2			
	2800	OTTA	40 F	1601.2	1602.1	2	8			
	2695	BOUL	2 SF	1602.5	1603	1.5	9	3		
	8800	SGMR	3 S	1620.2	1620.6	1.7	21.8	6.6		
	2695	SGMR	3 S	1620.2	1620.5	.8	37.7	11.3		
	2800	OTTA	3 S	1620	1620.3	2	15	3.4		
	2695	BOUL	8 S	1621	1621.5	1.5	14	5		
	2800	OTTA	8 S	1639	1639.1	.5	4.4	2.6		
	2800	OTTA	40 F	1720.8	1723	3.5	3.8			
	2695	BOUL	40 F	1721.5	1722	2.5	3	1		
	2695	BOUL	4 SF	1734.5	1735	2	13	4		
	2800	OTTA	3 S	1734	1734	2.2	16.6	4.2		
	2800	OTTA	26 FAL	1740	1800	20	-2.2	-1.1		
	2800	OTTA	240 R	1920	2010	50	3.2	1.6		
	2800	OTTA	1 S	2132.5	2132.9	1	2.2			
	2800	OTTA	1 S	2220.2	2220.5	1	4	2		
	2695	PENT	21 GRF	2235	2315	115	3.4	2		
	2695	PENT	1 S	2403	2403.2	1	3.2	1.4		
	2695	PENT	1 S	2407.9	2408	2	7	2.4		
15	2800	OTTA	240 R	1955	2020	25	2.2	1.1		
	2800	OTTA	1 S	2049.9	2050	1.5	6.6	2.2		
	2695	BOUL	2 SF	2050.5	2051	1	7	2		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JUNE 1978

JUN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	REMARKS
16	2800	OTTA	240 R	1230	1255	25	1.8	.9		
	2800	OTTA	22 GRF	1630	1740	215	2.4	1.6		
	2800	OTTA	240 R	1955	2020	25	1.8	.9		
	2800	OTTA	240AR	2210	2250	40	5.8	3.2		
	2800	OTTA	1 S	2235.2	2235.8	3	2.2	1.1		
	2695	BOUL	2 SF	2236	2237	1	4	1		
	2695	PENT	20 GRF	2320	2355	100	3.4	1.7		
17	2800	OTTA	240 R	1415	1550	35	4.6	2.3		
	2800	OTTA	240 R	1820	1840	20	3.4	1.7		
	2800	OTTA	20 GRF	1900	1910	10	1.8	.9		
	2800	OTTA	20 GRF	2015	2025	25	1.8	.9		
	2800	OTTA	1 S	2054	2054.5	2	1.2	.5		
	2800	OTTA	1 S	2108	2108.5	3	1.8	.9		
	2800	OTTA	20 GRF	2120	2140	90	2.2	1.4		
18	2695	PENT	21 GRF	0008	0045	100 D	7.8			
	2695	PENT	1 S	0009	0010.8	5	6.2	3		
	2695	PENT	1 S	0118	0119	3	3.2	1.6		
	2800	OTTA	20 GRF	1300		90	2.2			
	2800	OTTA	23 GRF	1515	1700	170	2.8	1.8		
	2695	PENT	1 S	1706	1707	2	2	1		
	2800	OTTA	240 R	2020	2035	15	1.8	.9		
	2800	OTTA	1 S	2147	2148	4	2.6	1.3		
	2695	BOUL	2 SF	2148 E	2148.5	1.50	4	1		
	2695	BOUL	2 SF	2410.5	2411.5	2 D	6	2		
19	2800	OTTA	21 GRF	1300	1410	130	2.8	1.4		
	2800	OTTA	1 S	1324	1325.5	4	2.2	1.4		
	2800	OTTA	27A RF	1540		230	2.2	2		
	2800	OTTA	24 R	1540	1550	10	2.2	1.1		
	2800	OTTA	24P R	1550		200	2.2			
	2800	OTTA	1 S	1615	1616	3	2.6	1		
	2800	OTTA	26 FAL	1910	1930	20	-2.2	-1.1		
	2695	PENT	21 GRF	2215	2350	165	4	2		
	2695	PENT	3 S	2336	2337.6	2.5	13	6		
20	2800	OTTA	20 GRF	1310	1333	120	1.4	.7		
	2800	OTTA	21 GRF	1705	1723	315	8.4	3.2		
	2800	OTTA	2 S/F	1724.5	1725	2.5	7.6	3.6		
21	2695	PENT	3 S	0041	0041.8	2	13.4	3.6		
	2800	OTTA	20 GRF	1120		100	3.2	2		
	2800	OTTA	20 GRF	1340	1425	75	2.2	1.8		
	2800	OTTA	21 GRF	1515	1623	190	6.2	3.1		
	8800	SGMR	3 S	1534.2	1536.6	3.3	20.5	8.2		
	2695	SGMR	1 S	1534.4	1535.5	3.2	3.7	1.5		
	2800	OTTA	2 S/F	1535	1536.5	3	3.2	1.8		
	2800	OTTA	20 GRF	1630	1904	90	3	1.4		
	2800	OTTA	240 R	2110	2140	30	4.6	2.6		
22	2800	OTTA	1 S	1431.5	1432	2	7.4	2.4		
	2695	SGMR	3 S	1641	1706.3	95	129	51.6		4,SWF
	2800	OTTA	45 C	1644	1706	90	113	66		
	2800	OTTA	30 PBI	1614	1614	265	39	18.2		
	8800	SGMR	20 GRF	1652	1709	83	38.4	15.4		4,SWF
	2695	BOUL	20 GRF	1652.5E	1703.5	80 D	117	39		
	2695	SGMR	3 S	1947	1950.6	14	11.1	4.4		SWF
	8800	SGMR	3 S	1948.8	1952.8	12.2	18.3	7.3		SWF
	2800	OTTA	1 S	1949	1951	8	6.4	3.1		
	2800	OTTA	1 S	2010	2014	10	3.6	1.8		
23	2800	OTTA	240 R	1150	1210	20	2.6	1.3		
	2800	OTTA	21 GRF	1320	1350	40	2.2	1.1		
	8800	SGMR	3 S	1320.8	1322.1	3.2	14.5	4.3		
	2695	SGMR	3 S	1321.4	1322	1.5	11.2	3.4		
	2800	OTTA	1 S	1321	1322	3	5.2	1.8		
	2800	OTTA	20 GRF	1730	1735	20	1.8	.9		
	2800	OTTA	1 S	1944	1945	2.5	2.2	1		
	2800	OTTA	1 S	2024	2024.5	1	2.2	1.1		
	2800	OTTA	20 GRF	2105	2113	20	2	1		
24	2800	OTTA	22 GRF	1525	1615	120	3.8	1.9		
	2800	OTTA	20 GRF	1730	1740	30	1.2	.8		
	2800	OTTA	240 R	2227	2240	13	3.6	2		
26	2800	OTTA	22 GRF	1200	1230	75	5.6	2.8		
	8800	SGMR	3 S	1436.5	1438.8	3.4	14.1	4.2		5,SWF
	2695	SGMR	3 S	1437.1	1438.3	4.1	21.3	6.4		5,SWF
	2800	OTTA	3 S	1437.9	1438.1	1.8	17.2	8		
	2800	OTTA	47 GB	1528	1539.5	32	1160	262		
	2800	OTTA	30 PBI	1600	1600	230	38	14		
	2695	BOUL	47 GB	1529 E	1541	73.50	1730	576		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JUNE 1978

JUN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22}Wm^{-2}Hz^{-1}$ PEAK	FLUX DENSITY MEAN	INT	REMARKS
	2695	SGMR	47 GB	1531.1	1539.5	37.7	1787	536		2,4,5,SWF
	8800	SGMR	3 S	1534.5	1543	27.7	218	65.5		2,4,5,SWF
	2800	OTTA	3 S	1615	1619.5	17	22.6	10.2		
	2800	OTTA	1 S	1633	1635	6	3.8	1.9		
	2800	OTTA	1 S	1718.5	1719.2	2	2.6	1.3		
	2800	OTTA	3 S	1735	1735.7	2	43	14.4		
	8800	SGMR	3 S	1735.4	1735.5	2.6	18.1	7.2		
	2695	SGMR	3 S	1735.2	1735.7	1.8	64.2	25.7		
	2800	OTTA	4 S/F	1802.3	1803	1.5	19	10		
	2800	OTTA	4 S/F	2205	2205.5	4	55	18.2		
	8800	SGMR	3 S	2205.5	2205.7	9.5	19.2	7.7		
	2695	SGMR	3 S	2205.1	2205.9	9.9	55.1	22		
	2800	OTTA	4 S/F	2239	2241	3	12.4	4.2		
	2695	PENT	21 GRF	2247	2325	75	3.6	1.8		
	2695	PENT	2 S/F	2315	2315.1	1	1.8			
	2695	PENT	1 S	2340	2340.5	1	4.4	1.4		
27	2695	PENT	21 GRF	0055	0110	30	2.8	1.4		
	2695	PENT	3 S	0100.3	0101.2	6	47	12		
	2695	PENT	1 S	0111	0111.9	4	3.6	1.6		
28	2800	OTTA	1 S	1649	1651.5	5	9.8	4.6		
	2800	OTTA	24 GRF	2016	2023.5	16	4.8	2.2		
	2800	OTTA	20 GRF	2105	2155	110	4.8	2.4		
29	2800	OTTA	3 S	1120	1121.7	2.5	10.4	4		
	8800	SGMR	3 S	1120	1121	2	14.7	5.9		
	2695	SGMR	3 S	1120.5	1122.5	2.4	10.2	4.1		
	2695	SGMR	3 S	1415.3	1415.5	14.6	66.3	27		5,SWF
	2695	BOUL	4 SF	1415 E	1417	11 D	63	21		
	2800	CTTA	20 GRF	1500	1530	30	3	1.5		
	2800	OTTA	20 GRF	1850	1930	140	5.8	2.9		
	2800	OTTA		2210	2233	40 D	8.4			
30	2695	SGMR	1 S	1052	1052.5	1.9	7.2	3.6		3
	2800	OTTA	20 GRF	1055	1155	105	3.4	1.7		
	2800	OTTA	3 S	1446.5	1449	10	44	13		
	2695	BOUL	1 S	1447 E	1450.5	9.5D	30	10		
	8800	SGMR	3 S	1447.3	1449.1	4	24.5	7.4		
	2695	SGMR	3 S	1447.3	1449.1	4.1	54.5	15.4		
	2695	SGMR	3 S	1624.5	1627.3	7.5	46.5	14		
	2800	OTTA	3 S	1625.2	1627	4.8	42	10.6		
	2800	OTTA	29 PBI	1630	1630	15	4.8	2.4		
	2695	BOUL	1 S	1626.5	1628.5	6	30	10		
	2800	OTTA		1650	1705.2	40	30			
	2695	SGMR	3 S	1702.6	1715.2	16.6	51.6	15.5		SWF
	2695	BOUL	41 F	1703.5	1716	13.5	30	10		
	8800	SGMR	3 S	1719.4	1719.6	1.6	164	32.8		SWF
	2800	OTTA	32A ABS	1735	1750	35	4	2		
	2800	OTTA	1 S	1800.5	1802	3	5.2	2.6		
	2695	BOUL	4 SF	1801.5	1803	3	7	2		
	2800	OTTA	20 GRF	1815	2000	235	4.8	2.6		

Observatories:

BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

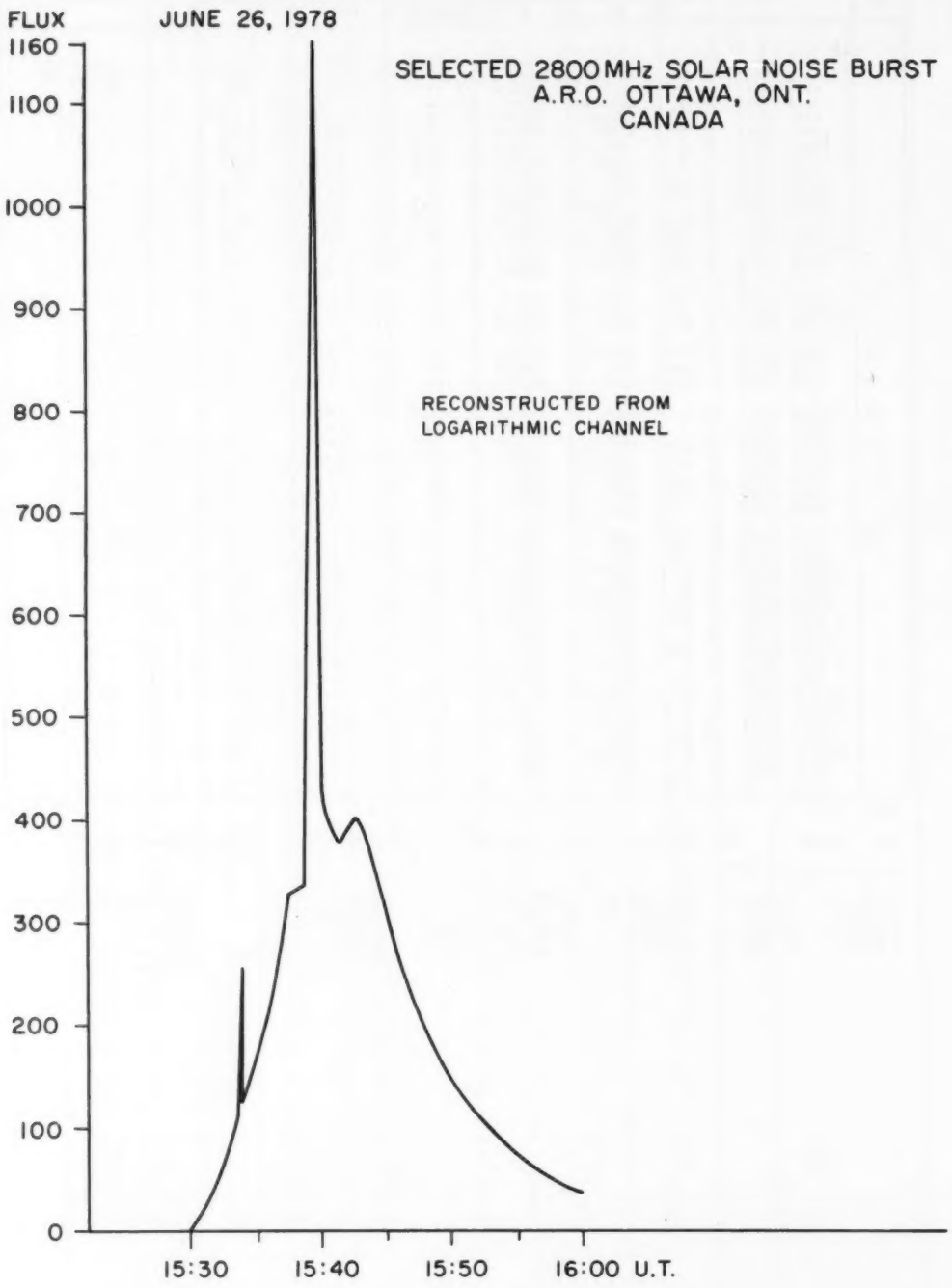
Explanation of Type Code:

1 Simple 1	6 Minor	22 Simple 3F	27 Rise and Fall	32 Absorption	44 Noise Storm in Progress
2 Simple 1F	7 Minor +	23 Simple 3AF	28 Precursor	40 Fluctuation	45 Complex
3 Simple 2	8 Spike	24 Rise	29 Post Burst Increase	41 Group of Bursts	46 Complex F
4 Simple 2F	20 Simple 3	25 Rise A	30 Post Burst Increase A	42 Series of Bursts	47 Great Burst
5 Simple	21 Simple 3A	26 Fall	31 Post Burst Decrease	43 Onset of Noise Storm	48 Major
					49 Major +

28
Jun 78

SELECTED SOLAR NOISE BURST

JUNE 26, 1978



SOLAR X-RAYS BY SATELLITE
SMS GOES
JUNE 1978

.5 - 4Å Hourly Averages (10^{-5} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
6/ 1	.017	.002	.003	.002	.002	.001	.002	.002	.002	.002	.001	.002	B	.002	.001	.002	.001	.001	.001	.002	.003	.019	.002	.002	.003
6/ 2	.001	.001	.002	.007	.002	.002	.006	.003	.002	.001	.001	.002	B	.001	.001	.001	.002	.003	.004	.004	.001	B	.001	.002	.002
6/ 3	.002	.002	.005	B	B	.003	.001	.002	.004	B	B	B	B	B	B	B	.013	B	B	B	B	B	B	B	.001
6/ 4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	M	B	.001	B	B	B	B	B
6/ 5	B	B	.004	B	.002	.005	.002	.038	.003	.001	.001	B	.001	.012	B	B	B	M	M	.001	B	B	B	B	.003
6/ 6	.001	B	.015	B	B	B	B	B	B	B	B	B	B	B	.003	B	B	B	B	.002	B	B	B	B	.001
6/ 7	B	B	B	B	B	B	B	B	.001	B	B	B	B	B	B	B	B	B	B	B	.001	.001	B	B	B
6/ 8	.001	B	B	.001	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/ 9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	M	.001	B	.001	M	M
6/10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/11	.001	B	.008	B	.002	B	.002	B	B	B	B	B	B	B	B	.004	.006	B	.001	B	.001	.003	.001	B	.001
6/12	B	B	B	B	.001	B	B	B	B	B	B	B	B	B	.001	.001	B	.001	B	.002	.002	.002	B	B	.002
6/13	.001	.006	B	B	.003	B	B	.001	.002	B	B	.013	.001	B	B	B	B	.002	B	B	.002	B	.002	.003	.001
6/14	.002	.002	B	B	B	B	B	.001	.001	.002	B	B	.001	B	B	B	B	B	B	B	.004	B	B	B	B
6/15	.002	.002	B	.002	B	.002	B	B	B	.001	B	B	B	B	B	B	B	B	B	B	.001	M	.015	.028	.004
6/16	B	B	B	B	B	B	B	B	.001	B	B	B	B	B	B	B	B	B	B	B	.002	B	.002	B	.002
6/17	.013	.003	.006	.003	.001	.003	.003	B	B	B	B	B	B	B	B	B	.001	.001	.002	.010	.002	.002	.003	.002	.001
6/18	.014	.008	B	B	B	B	B	.002	B	B	B	B	B	B	B	B	.002	B	B	.002	.006	.004	.001	.001	.002
6/19	.001	.001	.002	.002	.005	.003	.002	.006	.003	.002	.002	.004	.005	.002	.006	.005	M	.002	.004	.002	.004	.006	.002	.005	.003
6/20	.002	.002	.002	.004	.002	.002	.002	.002	.005	.006	.002	.006	.003	.002	.002	.017	.002	.002	.002	.002	.001	.002	.002	.002	.005
6/21	.002	.002	.002	.002	.001	.008	.001	.002	.002	.003	.002	.002	B	.002	.001	B	.006	.165	.065	.036	.050	.008	.002	.001	.003
6/22	.001	.002	.034	.003	.002	.002	.023	B	.001	.002	.005	B	.001	.002	.001	B	.003	.001	B	B	.001	.003	B	.002	.003
6/23	.002	.001	.001	.001	B	.001	B	.022	.006	.001	.001	B	.001	.005	B	.001	.001	.001	.014	.002	.003	.001	.002	.001	.002
6/24	B	.001	.001	.001	B	.001	B	.002	.001	B	.001	.006	.001	.001	B	B	B	.002	.001	.002	B	B	B	M	.002
6/25	.005	.001	.001	.006	.007	.001	.002	.001	.020	.002	.001	.002	.005	.001	.004	.132	.147	.027	.008	.002	.004	.002	.014	.002	.014
6/26	.001	.001	B	B	B	B	B	B	B	B	B	B	.001	B	.032	.010	B	.002	.001	.001	B	.001	B	.001	.003
6/27	B	.010	B	B	B	.001	B	.002	.002	B	.001	.003	B	B	B	B	.003	.002	.002	.002	.002	.007	.006	.001	.024
6/28	.001	.003	.055	B	B	B	P	B	.002	.002	.001	M	.002	.001	.007	.001	.001	.001	.001	.003	.002	.001	.022	.011	.005
6/29	.002	.002	.002	.007	.009	.006	.001	.003	.001	.001	.006	.013	B	.002	.010	.007	.004	.018	.008	.002	.001	.002	B	.001	.004
6/30	.001	.006	.019	.001	B	B	.001	.004	.001	.003	.001	.001													

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
JUNE 1978

1 - 8Å Hourly Averages (10^{-4} watts/m^2)

MO	DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
6/	1	.038	.013	.014	.013	.011	.009	.010	.012	.011	.011	.011	.013	.010	.012	.010	.013	.012	.011	.010	.011	.013	.036	.011	.011	.009
6/	2	.010	.009	.012	.023	.014	.014	.019	.019	.018	.013	.010	.012	.009	.008	.010	.011	.011	.015	.020	.021	.012	.009	.009	.012	.008
6/	3	.011	.011	.020	.009	.008	.013	.016	.011	.010	.007	.007	.007	.006	.006	.007	.006	.006	.007	.007	.006	.006	.006	.008	.006	.005
6/	4	.006	.006	.006	.006	.005	.008	.006	.005	.005	.004	.005	.015	.025	.004	.006	.007	.005	.004	.004	.004	.004	.004	.004	.006	.005
6/	5	.007	.006	.012	.008	.010	.013	.017	.043	.015	.007	.008	.006	.006	.024	.005	.004	.004	M	.005	.006	.004	.003	.004	.003	.006
6/	6	.006	.037	.017	.003	.003	.003	.003	.003	.015	.004	.003	.004	.004	.003	.004	.003	.003	.003	M	.003	.003	.003	.003	.003	.004
6/	7	.003	.004	.004	.004	.003	.003	.004	.004	.006	.004	.004	.004	.004	.004	.004	.003	.004	.005	.005	.005	.007	.003	.003	.003	.002
6/	8	.005	.004	.004	.004	.003	.003	.003	.003	.003	.003	.002	.003	.003	.002	.003	.003	.004	.003	.003	.005	.006	.003	.002	.002	.002
6/	9	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.003	.003	.004	.003	.003	.002	.002	.002	.002
6/10		.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	B
6/11		.007	.003	.015	.004	.006	.004	.008	.004	.002	.003	.003	.005	.003	.003	.003	.002	.003	.004	M	.006	.005	.006	M	M	.002
6/12		.002	.002	.002	.003	.006	.003	.003	.003	.003	.003	.005	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002
6/13		.007	.015	.007	.006	.030	.006	.005	.006	.007	.006	.006	.006	.007	.005	.006	.006	.004	.006	.004	.006	.007	.005	.003	.026	.005
6/14		.007	.027	.006	.005	.005	.005	.005	.007	.006	.009	.005	.006	.008	.004	.005	.005	.028	.007	.005	.005	.009	.007	.010	.013	.005
6/15		.010	.009	.008	.009	.007	.009	.007	.006	.060	.008	.007	.021	.005	.006	.006	.005	.005	.005	.005	.005	.012	.007	.007	.007	.005
6/16		.007	.008	.007	.007	.008	.008	.008	.007	.008	.008	.007	.007	.008	.008	.009	.009	.010	.028	.008	.007	.009	M	.032	.050	.008
6/17		.037	.018	.025	.016	.011	.013	.015	.009	.008	.008	.007	.008	.008	.007	.007	.011	.011	.011	.024	.015	.012	.016	.013	.011	.008
6/18		.032	.025	.010	.009	.009	.009	.009	.011	.009	.008	.008	.009	.010	.009	.009	.010	.012	.010	.009	.010	.017	.018	.011	.012	.007
6/19		.011	.011	.013	.012	.018	.014	.012	.020	.017	.016	.016	.019	.018	.016	.021	.019	M	.017	.019	.015	.018	.019	.014	.020	.010
6/20		.015	.015	.013	.018	.016	.015	.016	.017	.019	.021	.013	.017	.016	.014	.012	.014	.012	.022	.016	.055	.014	.011	.013	.014	.011
6/21		.013	.016	.014	.015	.018	.026	.014	.014	.014	.027	.015	.013	.016	.012	.013	.030	.016	.015	.013	.015	.012	.017	.012	.038	.010
6/22		.024	.036	.041	.019	.013	.014	.039	.018	.010	.013	.019	.011	.010	.021	.022	.023	.019	.219	.155	.091	.096	.033	.020	.016	.020
6/23		.014	.013	.014	.013	.011	.012	.011	.050	.028	.012	.014	.011	.036	.015	.012	.011	.054	.014	.011	.010	.011	.013	.023	.024	.010
6/24		.010	.036	.012	.013	.012	.024	.011	.013	.011	.011	.013	.020	.015	.019	.012	.014	.014	.016	.036	.019	.021	.016	.026	.018	.010
6/25		.023	.016	.015	.023	.025	.013	.015	.012	.033	.018	.012	.012	.011	.011	.010	.010	.011	.016	.013	.012	.010	.032	.008	M	.008
6/26		.053	.010	.010	.009	.021	.010	.010	.010	.010	.009	.009	.010	.017	.012	.015	.100	.192	.127	.030	.019	.019	.017	.031	.016	.023
6/27		.011	.021	.011	.010	.010	.011	.010	.012	.014	.011	.012	.013	.011	.010	.030	.035	.032	.133	.011	.010	.010	.034	.010	.067	.013
6/28		.011	.017	.049	.011	.010	.011	.010	.010	.012	.016	.013	M	.011	.010	.010	.010	.051	.061	.013	.023	.015	.023	.025	.017	.011
6/29		.015	.014	.014	.024	.021	.022	.012	.014	.011	.011	.025	.026	.017	.024	.017	.011	.012	.010	.011	.018	.012	.010	.042	.031	.011
6/30		.013	.017	.034	.013	.010	.009	.010	.015	.010	.014	.010	.010	.009	.012	.018	.026	.016	.031	.024	.015	.013	.012	.011	.010	.010

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE

GOES

JUNE 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
1	0158	2.2E-08	1.2E-06	0207	7.6E-08	2.1E-06	0217	1.7E-08	1.6E-06
1	0643	1.2E-08	9.1E-07	0648	6.5E-08	2.0E-06	0652	3.2E-08	1.4E-06
1	0731	2.6E-08	1.3E-06	0734	3.3E-08	2.0E-06	0736	3.3E-08	1.4E-06
1	0756	1.8E-08	1.2E-06	0759	8.3E-08	2.0E-06	0806	3.2E-08	1.5E-06
1	1026	1.0E-08	1.0E-06	1029	4.6E-08	1.5E-06	1034	1.9E-08	1.2E-06
1	1324	1.9E-08	1.2E-06	1331	9.2E-08	2.3E-06	1335	2.1E-08	1.7E-06
1	1452	2.0E-08	1.2E-06	1455	2.7E-08	1.8E-06	1457	2.9E-08	1.4E-06
1	2100	2.1E-08	1.1E-06	2111	7.8E-07	1.0E-05	2118	2.0E-07	5.6E-06
1	2340	2.8E-08	1.3E-06	2343	3.6E-08	2.0E-06	2350	2.8E-08	1.5E-06
2	0251	2.0E-08	1.3E-06	0304	2.6E-07	5.2E-06	0314	9.8E-08	3.2E-06
2	0612	2.2E-08	1.4E-06	0616	1.2E-07	2.6E-06	0620	2.7E-08	1.8E-06
2	0750	1.5E-08	1.9E-06	0754	1.9E-07	3.6E-06	0756	6.8E-08	2.6E-06
2	0953	4.9E-09	1.1E-06	0956	2.9E-08	2.2E-06	0958	2.2E-08	1.3E-06
2	1105	1.9E-08	1.2E-06	1112	1.6E-07	3.1E-06	1115	3.1E-08	1.7E-06
2	1933	6.9E-09	1.6E-06	1939	1.5E-07	3.2E-06	1947	5.5E-08	2.3E-06
2	2303	2.3E-08	1.1E-06	2306	5.2E-08	1.7E-06	2308	1.6E-08	1.1E-06
2	2309	1.8E-08	1.1E-06	2312	1.3E-07	2.5E-06	2318	3.1E-08	1.8E-06
3	0024	2.0E-08	1.0E-06	0027	4.9E-08	2.0E-06	0037	3.7E-08	1.5E-06
3	0230	5.2E-08	2.2E-06	0234	1.5E-07	3.3E-06	0239	6.9E-08	2.6E-06
3	2211	4.6E-09	5.8E-07	2218	5.3E-08	1.5E-06	2226	1.4E-08	1.0E-06
5	0046	4.0E-09	5.4E-07	0052	3.8E-08	1.1E-06	0059	1.0E-08	7.7E-07
5	0220	3.1E-09	6.0E-07	0231	1.6E-07	2.7E-06	0240	5.4E-08	1.6E-06
5	0411	4.2E-09	6.5E-07	0417	7.5E-08	1.4E-06	0432	2.3E-08	1.0E-06
5	0524	1.5E-08	7.7E-07	0537	1.3E-07	2.3E-06	0557	4.3E-08	1.5E-06
5	0728	2.6E-07	2.6E-06	0744	9.9E-07	9.5E-06	0756	2.7E-07	5.8E-06
5	1056	8.0E-09	6.9E-07	1100	3.2E-08	1.0E-06	1104	1.3E-08	8.5E-07
5	1245	1.4E-08	6.3E-07	1313	4.0E-07	5.4E-06	1325	9.9E-08	2.9E-06
7	1849	3.9E-09	4.2E-07	1854	9.7E-08	1.5E-06	1903	2.5E-08	9.3E-07
8	0015	2.0E-09	2.9E-07	0024	1.0E-07	1.4E-06	0029	2.0E-08	7.6E-07
10	2346	1.3E-07	1.7E-06	2351	1.6E-07	2.7E-06	2355	9.3E-08	2.2E-06
11	0413	1.6E-08	3.4E-07	0420	1.0E-07	1.9E-06	0426	3.6E-08	1.0E-06
11	0553	3.7E-08	3.2E-07	0601	1.3E-07	2.2E-06	0609	4.4E-08	1.2E-06
12	0408	3.2E-10	2.7E-07	0423	1.0E-07	2.2E-06	0426	4.7E-08	1.1E-06
12	2033	3.4E-09	5.0E-07	2045	4.1E-08	1.1E-06	2049	1.9E-08	8.2E-07
12	2118	1.5E-08	5.1E-07	2121	2.7E-07	3.0E-06	2127	6.1E-08	1.6E-06
12	2237	1.2E-08	4.1E-07	2244	4.9E-08	1.1E-06	2247	1.9E-08	7.5E-07
12	2349	5.5E-09	3.2E-07	0006	3.5E-08	1.0E-06	0013	1.2E-08	5.8E-07
13	0133	2.9E-08	1.0E-06	0140	2.9E-07	3.9E-06	0144	1.0E-07	2.4E-06
13	0437	3.4E-09	4.9E-07	0442	1.3E-07	2.1E-06	0451	4.0E-08	1.2E-06
13	0703	1.0E-08	5.4E-07	0708	5.9E-08	1.2E-06	0714	2.0E-08	8.4E-07
13	0829	1.7E-08	6.2E-07	0834	7.0E-08	1.4E-06	0842	3.2E-08	1.0E-06
13	1219	6.2E-09	5.7E-07	1224	3.6E-08	1.0E-06	1229	1.9E-08	7.9E-07
13	1405	3.1E-08	4.3E-07	1410	5.2E-08	1.1E-06	1422	1.1E-08	7.7E-07
13	1508	6.2E-09	5.9E-07	1511	9.3E-08	2.0E-06	1514	2.7E-08	1.0E-06
13	1714	1.8E-08	3.0E-07	1718	1.2E-07	1.7E-06	1720	3.3E-08	8.1E-07
13	1737	1.3E-08	6.4E-07	1740	8.3E-08	2.2E-06	1742	1.1E-08	7.4E-07
13	1916	7.3E-09	4.4E-07	1920	1.2E-07	2.0E-06	1923	5.1E-08	1.0E-06
13	2011	6.3E-09	4.5E-07	2019	9.2E-08	2.1E-06	2021	4.9E-08	1.2E-06
14	0125	5.1E-09	4.3E-07	0130	1.1E-07	2.2E-06	0133	3.9E-08	9.9E-07
14	0555	8.7E-08	5.2E-07	0600	1.0E-07	2.1E-06	0602	1.3E-08	6.9E-07
14	0841	4.1E-09	4.3E-07	0845	1.1E-07	1.4E-06	0847	1.9E-08	7.9E-07
14	0906	2.9E-08	8.9E-07	0910	2.5E-07	2.8E-06	0912	5.5E-08	1.6E-06

SOLAR X-RAYS BY SATELLITE

GOES

JUNE 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
14	1616	3.3E-09	6.2E-07	1621	3.4E-08	1.0E-06	1623	9.2E-09	7.2E-07
14	1957	1.2E-08	7.3E-07	2005	3.5E-08	1.2E-06	2013	1.5E-08	9.5E-07
15	0333	9.0E-09	7.3E-07	0337	1.3E-07	2.3E-06	0342	4.9E-08	1.4E-06
16	2002	6.9E-09	8.1E-07	2006	6.0E-08	1.5E-06	2012	2.1E-08	1.1E-06
17	0153	2.0E-08	1.5E-06	0156	1.2E-07	2.4E-06	0211	2.9E-08	1.9E-06
18	0007	6.2E-09	1.0E-06	0034	4.6E-07	6.7E-06	0047	1.3E-07	3.8E-06
18	0116	1.6E-08	1.9E-06	0120	7.1E-07	7.1E-06	0124	2.0E-07	4.2E-06
18	1635	7.0E-09	9.4E-07	1643	6.3E-08	2.0E-06	1655	2.4E-08	1.4E-06
19	0649	4.3E-08	1.3E-06	0652	9.6E-08	1.8E-06	0702	4.4E-08	1.5E-06
19	1222	2.7E-08	1.5E-06	1228	3.1E-07	4.2E-06	1234	6.0E-08	2.6E-06
19	1324	1.9E-08	1.4E-06	1328	5.3E-08	2.1E-06	1351	6.2E-09	1.7E-06
19	1515	3.7E-08	1.5E-06	1521	1.7E-07	3.0E-06	1529	5.1E-08	2.3E-06
19	2129	2.4E-08	1.3E-06	2138	1.6E-07	3.1E-06	2156	4.9E-08	2.2E-06
19	2335	2.1E-08	1.5E-06	2345	1.5E-07	3.6E-06	2352	4.6E-08	2.4E-06
20	0920	1.7E-08	1.7E-06	0926	2.7E-07	3.7E-06	0931	9.6E-08	2.6E-06
20	1054	1.5E-08	1.3E-06	1057	6.1E-08	1.9E-06	1100	1.4E-08	1.6E-06
20	1150	6.5E-08	2.0E-06	1157	2.7E-07	3.8E-06	1204	1.0E-07	2.8E-06
20	1915	8.6E-08	2.3E-06	1925	2.0E-06	1.5E-05	1935	4.8E-07	8.1E-06
20	2207	1.2E-08	1.1E-06	2212	1.5E-07	2.6E-06	2214	4.4E-08	1.9E-06
21	1532	2.8E-08	1.5E-06	1538	6.7E-07	6.5E-06	1552	2.0E-07	3.9E-06
21	2147	2.2E-08	1.5E-06	2152	1.4E-07	3.0E-06	2157	4.2E-08	2.1E-06
21	2347	8.5E-08	1.1E-06	2350	1.3E-07	2.4E-06	2354	2.3E-08	1.6E-06
22	0232	1.4E-08	1.3E-06	0247	1.8E-06	1.4E-05	0254	4.9E-07	7.2E-06
22	0522	1.8E-08	1.4E-06	0525	3.0E-08	1.9E-06	0528	2.8E-08	1.5E-06
22	0558	1.9E-08	1.4E-06	0609	9.6E-07	9.7E-06	0621	1.7E-07	5.3E-06
22	1023	1.6E-08	1.4E-06	1029	3.1E-07	3.9E-06	1035	8.0E-08	2.6E-06
22	2016	1.3E-06	1.0E-05	2019	2.1E-06	2.0E-05	2024	1.3E-06	1.4E-05
23	1316	1.2E-08	1.3E-06	1324	6.2E-08	2.2E-06	1328	8.5E-09	1.7E-06
23	1620	2.1E-08	1.5E-06	1623	2.5E-08	2.3E-06	1627	2.3E-08	1.5E-06
24	0756	1.1E-08	1.2E-06	0759	3.1E-08	1.9E-06	0801	2.3E-08	1.4E-06
24	1318	2.2E-08	1.5E-06	1332	1.8E-07	3.4E-06	1339	4.2E-08	2.3E-06
24	1524	1.0E-08	1.3E-06	1527	2.3E-08	2.1E-06	1533	1.4E-08	1.7E-06
25	0032	3.8E-08	2.2E-06	0036	1.5E-07	3.3E-06	0044	6.5E-08	2.6E-06
25	0609	2.1E-08	1.3E-06	0612	3.3E-08	2.0E-06	0617	3.0E-08	1.6E-06
25	0822	3.7E-08	1.3E-06	0837	5.3E-07	6.0E-06	0858	1.2E-07	3.6E-06
25	1338	1.9E-08	1.2E-06	1341	4.1E-08	2.0E-06	1343	3.7E-08	1.4E-06
25	1723	9.6E-09	1.1E-06	1734	7.3E-08	2.4E-06	1752	1.2E-08	1.7E-06
25	1943	1.1E-08	1.1E-06	1949	5.8E-08	1.8E-06	1952	2.5E-08	1.4E-06
26	1207	2.1E-08	1.1E-06	1216	8.8E-08	2.1E-06	1221	3.3E-08	1.6E-06
26	1533	5.2E-08	1.6E-06	1558	3.8E-06	3.3E-05	1631	1.2E-06	1.7E-05
26	2008	2.8E-08	1.9E-06	2015	1.6E-07	3.4E-06	2020	7.6E-08	2.5E-06
26	2202	1.7E-08	1.5E-06	2207	8.0E-07	7.9E-06	2213	1.8E-07	4.6E-06
26	2236	1.9E-08	1.5E-06	2243	2.8E-07	5.3E-06	2253	9.6E-08	3.2E-06
27	0057	1.1E-08	1.2E-06	0106	7.9E-07	7.3E-06	0111	1.3E-07	3.6E-06
27	0150	1.2E-08	1.2E-06	0155	9.3E-08	2.4E-06	0201	1.7E-08	1.8E-06
27	0657	1.1E-08	1.1E-06	0702	1.2E-07	2.4E-06	0705	2.2E-08	1.6E-06
27	0959	5.7E-09	1.0E-06	1005	1.1E-07	2.6E-06	1009	1.0E-08	1.6E-06
27	1141	3.3E-08	1.3E-06	1152	1.0E-07	2.4E-06	1155	4.3E-08	1.9E-06
28	0111	1.1E-08	1.1E-06	0119	1.3E-07	3.1E-06	0124	3.2E-08	1.9E-06
28	0242	6.6E-09	1.1E-06	0247	5.4E-06	2.8E-05	0254	8.5E-07	1.2E-05
28	1651	5.7E-08	1.9E-06	1656	1.5E-07	3.1E-06	1701	6.0E-08	2.4E-06
28	1801	1.3E-08	1.2E-06	1804	3.8E-08	1.8E-06	1806	2.6E-08	1.4E-06

SOLAR X-RAYS BY SATELLITE

GOES

JUNE 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
28	1847	1.0E-08	1.1E-06	1852	1.5E-07	2.7E-06	1855	2.0E-08	1.8E-06
28	1913	1.5E-08	1.2E-06	1916	1.7E-07	2.3E-06	1918	1.7E-08	1.2E-06
28	2017	1.5E-08	1.2E-06	2020	3.4E-08	2.2E-06	2045	1.1E-08	1.7E-06
29	0323	3.7E-08	2.2E-06	0327	2.0E-07	4.1E-06	0331	1.1E-07	3.1E-06
29	0455	2.1E-08	1.5E-06	0500	3.3E-07	4.0E-06	0505	7.0E-08	2.6E-06
29	1117	3.0E-08	1.5E-06	1123	6.5E-07	6.4E-06	1128	2.0E-07	3.7E-06
29	1413	8.7E-09	1.0E-06	1418	6.4E-07	5.7E-06	1423	1.4E-07	3.4E-06
29	1539	7.6E-09	1.0E-06	1542	4.6E-08	2.1E-06	1544	2.4E-08	1.3E-06
29	2207	2.8E-08	1.4E-06	2216	9.7E-07	8.4E-06	2221	2.3E-07	4.8E-06
29	2231	1.1E-07	3.0E-06	2239	4.4E-07	6.5E-06	2247	1.5E-07	4.6E-06
29	2303	1.5E-07	3.3E-06	2309	5.4E-07	6.7E-06	2315	1.5E-07	4.6E-06
30	0121	1.3E-08	1.1E-06	0125	5.8E-08	1.8E-06	0128	2.0E-08	1.4E-06
30	0146	1.8E-08	1.2E-06	0155	4.4E-07	5.2E-06	0202	1.2E-07	3.0E-06
30	0228	7.1E-08	2.4E-06	0235	6.0E-07	6.9E-06	0239	1.6E-07	4.3E-06
30	0712	1.9E-08	1.0E-06	0719	9.8E-08	2.2E-06	0726	2.5E-08	1.6E-06
30	0745	2.1E-08	1.2E-06	0753	1.3E-07	2.5E-06	0758	3.3E-08	1.8E-06
30	0912	2.0E-08	1.1E-06	0923	7.9E-08	2.3E-06	0932	1.7E-08	1.7E-06
30	1050	4.2E-09	8.1E-07	1053	4.4E-08	1.9E-06	1056	1.8E-08	1.2E-06
30	1145	6.5E-09	8.9E-07	1149	3.8E-08	1.5E-06	1156	1.3E-08	1.2E-06
30	1443	1.0E-08	9.0E-07	1453	6.3E-07	6.5E-06	1513	1.0E-07	3.6E-06
30	1623	1.1E-08	1.0E-06	1630	1.6E-07	2.9E-06	1642	4.3E-08	1.9E-06
30	1701	2.2E-08	1.4E-06	1713	8.7E-07	7.9E-06	1724	1.7E-07	4.0E-06
30	1759	1.7E-08	1.6E-06	1805	3.7E-07	4.4E-06	1815	9.5E-08	2.9E-06
30	2351	6.1E-09	9.0E-07	2354	3.3E-08	1.3E-06	2357	1.2E-08	1.0E-06

SOLAR WIND

Interplanetary Scintillations

JUNE 1978

DAY	3C48 VEL	3C48 ERR	3C144 VEL	3C144 ERR	3C147 VEL	3C147 ERR	3C161 VEL	3C161 ERR	3C237 VEL	3C237 ERR	3C273 VEL	3C273 ERR	3C298 VEL	3C298 ERR	3C459 VEL	3C459 ERR
1	528	8					592	11	252	55	377	8	339	5	365	69
2	590	62					498	28	557	64	482	15	509	29	764	37
3	339	54			484	*	460	34	361	50	511	7	478	44		
4	569	23			546	*	507	10					469	25	665	8
5	467	10			437	77	394	49	411	26	561	68	374	77	565	27
6	471	46					422	6	401	49	483	8	503	61		
7	423	14					415	12	353	11	406	4	386	4	260	51
8	406	13			502	90	524	74			419	14	374	9	393	51
11	409	*													475	32
13	469	72														
14	418	18														
16	286	20					414	43								
17	389	20					361	6	336	8	383	31	379	47		
18	401	7			403	55	461	40	434	16	328	7	330	16		
19	377	5					563	34	583	42	421	5	423	6		
20	342	7							488	63			364	119		
21	334	9			513	130	516	46	429	54	501	7	470	6		
22	408	7					650	36							495	155
23	456	8					533	61	384	16	517	37	485	40	600	114
24	312	16					506	43	321	65	479	9	402	6		
25	460	19			473	32	510	21	656	125						
26	426	124									562	10	540	59		
27	467	75			453	66	486	56	381	47	437	11				
28	353	14			356	7	380	11	342	7	437	30	349	23		
29	432	18			390	14	425	17	353	7	417	60	370	7	366	91
30	368	17			426	102	394	5	303	20	463	4	506	8	456	18

JUNE	5 UT	5 LAT	5 DIST	5 DLON	15 UT	15 LAT	15 DIST	15 DLON	25 UT	25 LAT	25 DIST	25 DLON
3C48	17.	26.	0.70	38.	16.	20.	0.80	32.	16.	16.	0.88	25.
3C144	21.	-15.	0.15	-81.	20.	-47.	0.03	86.	19.	0.	0.18	79.
3C147	20.	50.	0.48	-42.	19.	62.	0.45	-22.	19.	63.	0.46	17.
3C161	22.	-46.	0.59	-32.	22.	-54.	0.52	-21.	21.	-58.	0.49	2.
3C237	2.	-3.	0.97	-17.	1.	-3.	0.92	-23.	0.	-4.	0.84	-33.
3C273	4.	0.	1.14	-14.	3.	0.	1.10	-16.	2.	1.	1.05	-17.
3C298	6.	3.	1.22	-10.	5.	4.	1.19	-12.	4.	5.	1.16	-13.
3C459	14.	4.	1.01	17.	14.	5.	1.06	16.	13.	6.	1.11	15.

* indicates data for which no error estimates are available since only two antennas were operating.

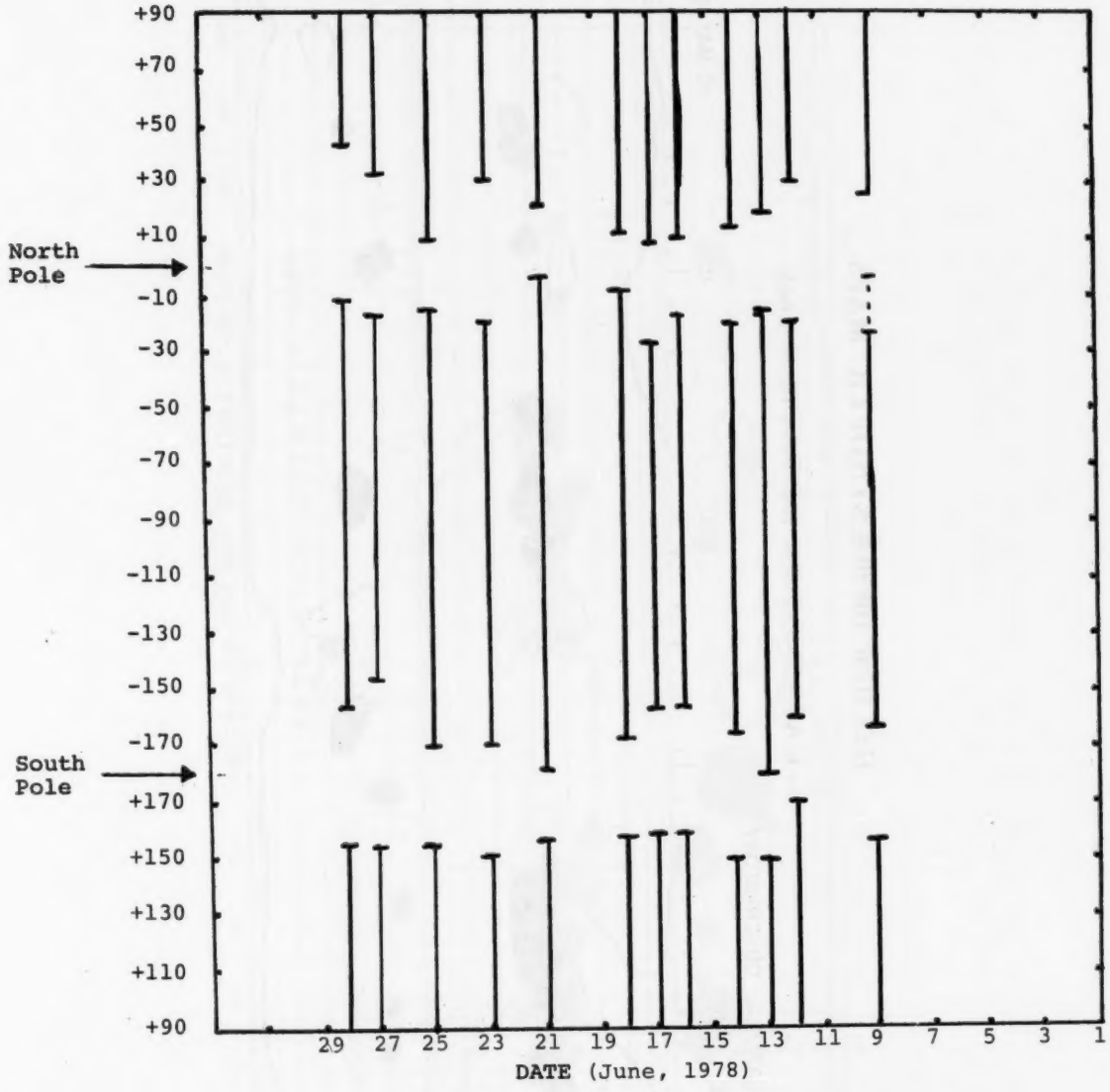
CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

JUNE 1978

Big Bear Solar Observatory

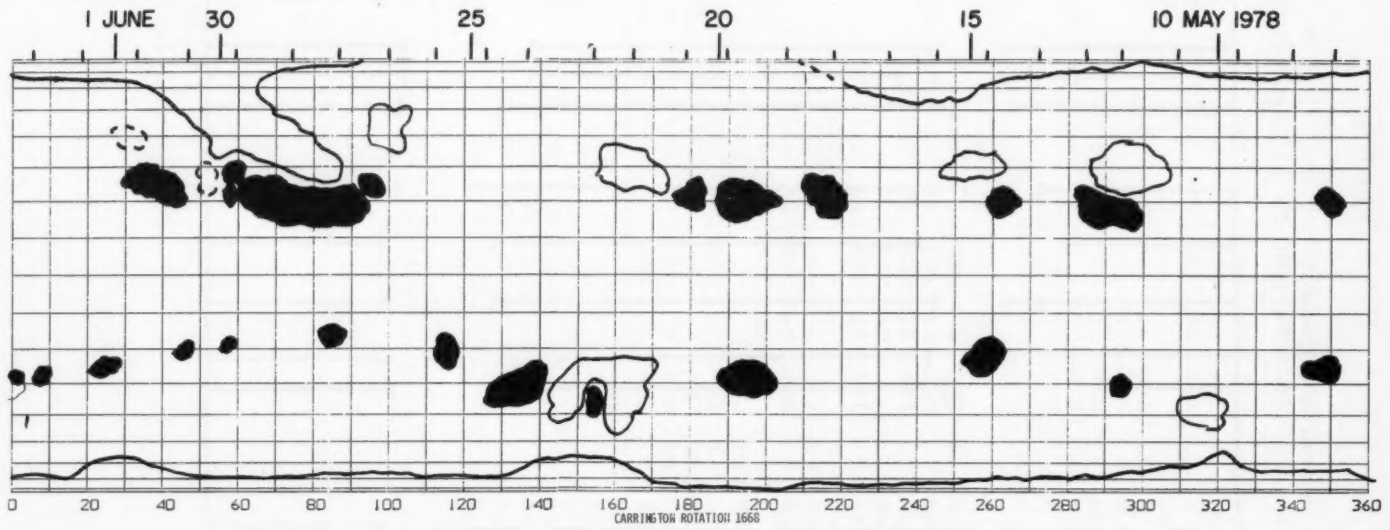
OBSERVATIONS OF D3 CHROMOSPHERE AT SOLAR LIMB



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1668

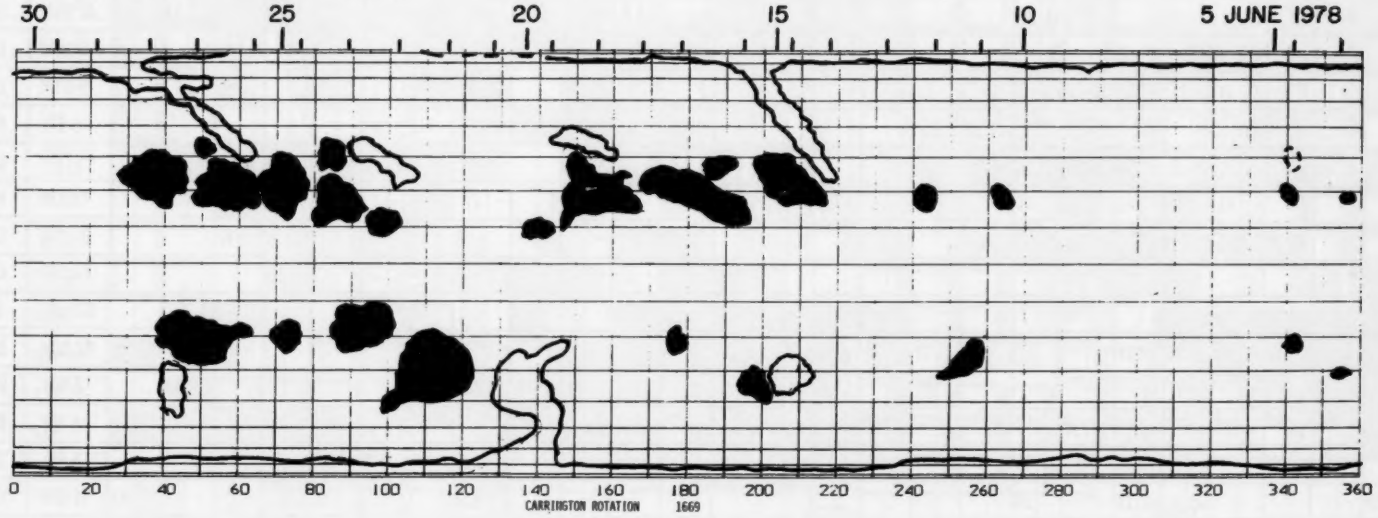
KITT PEAK NATIONAL OBSERVATORY



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1669

KITT PEAK NATIONAL OBSERVATORY



INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1965	APR 16			TA		TA	-	AT	TA			AT				-	-	TA		AT	AT			TA				AT
1966	MAY 13	TA		-	-	TA			TA											AT		-	-	AT	T*	-	T*					AT	AT	-
1967	JUN 9								TA		-			TA						AT	A*							AT	*		A*		TA	TA
1968	JUL 6										A*			T*	TA	TA			T*			AT			-	AT			-		
1969	AUG 2		TA						TA	-			TA	*									AT	TA								
1970	AUG 29			-	-	-		TA										AT	AT			AT		TA	TA	-	AT		AT				
1971	SEP 25						-	-	-	-	-						TA				TA											
1972	OCT 22					-	AT														AT	AT					*					
1973	NOV 18			TA	AT						-		AT							*			*			*						
1974	DEC 15				-	-		-	AT	-		AT			AT		AT			TA		TA		TA				*				
1975	1978 JAN 11		*	*						*	*	*						*			TA		-	AT			-					-
1976	FEB 7						*	TA				-			-							-		*			TA		A*	TA		
1977	MAR 6	TA		-					AT			T*	*					TA			AT	AT		AT		AT		*	TA				
1978	APR 2							*	-		AT												AT	AT									
1979	APR 29		TA		*		TA		AT	AT	TA			-	-	T*				TA	TA			AT									
1980	MAY 26				TA			AT	AT				-			AT	TA					-						-		-		-
1981	JUN 22	TA					A*																										

[ ] = definitely towards the sun [ ] = definitely away from the sun

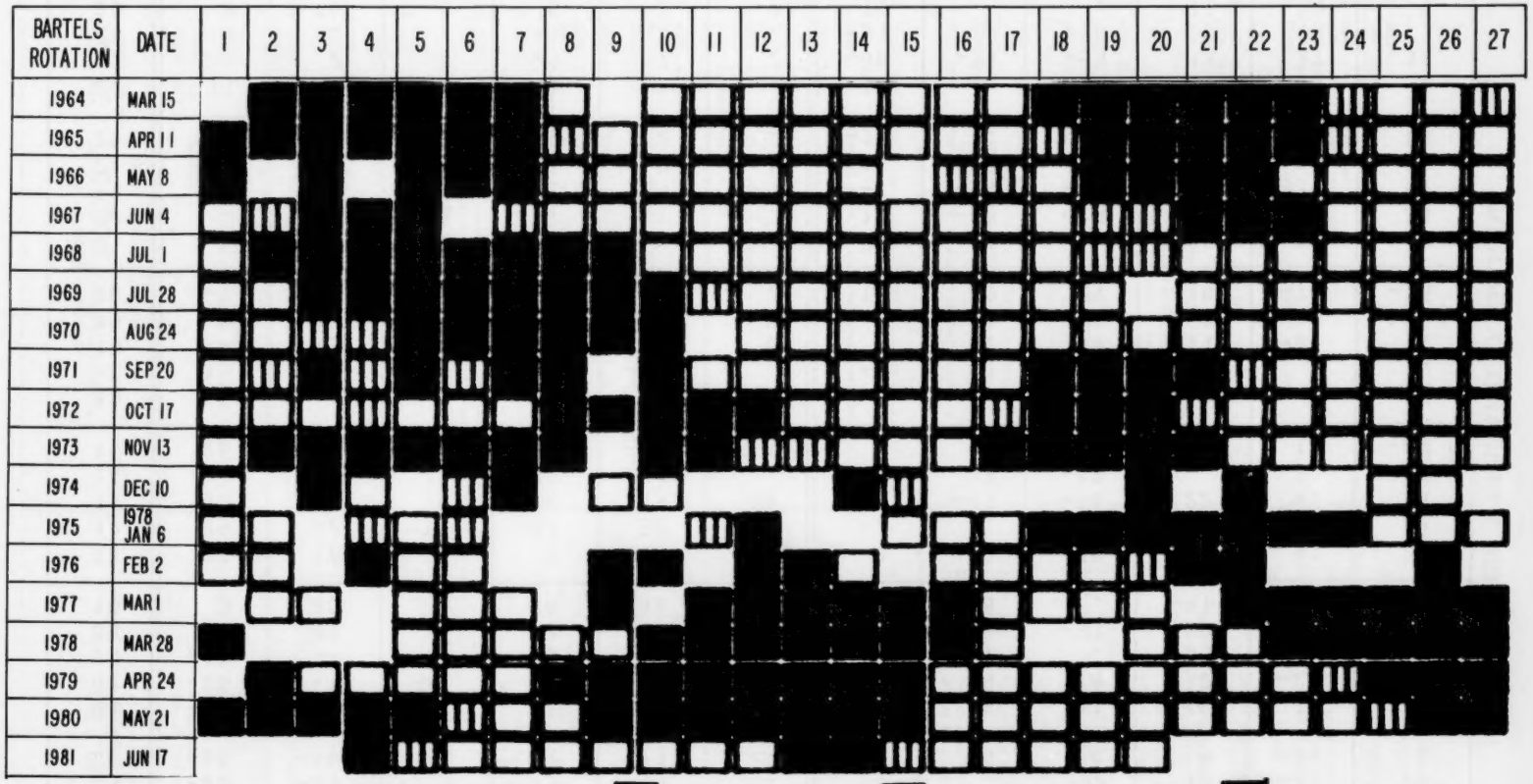
T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.

Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

STANFORD MEAN SOLAR MAGNETIC FIELD



POLARITY OF THE MEAN SOLAR MAGNETIC FIELD: □ = FIELD >2μT, ▥ = -2μT ≤FIELD ≤2μT, ■ = FIELD <-2μT

No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT. Dates given are not Bartels Rotation dates. These earlier dates correspond to the occurrence of phenomena on the sun which affect the Earth during the given Bartels Rotation.

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

	1977						1978					
	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE
DAY												
01	2	-16	-9	9	6	-14	.	16	.	52	-12	-28
02	-12	-23	-13	6	1	-10	.	31	22	46	-34	-22
03	-18	-25	.	3	-14	-7	14	26	12	43	-27	-12
04	-26	-23	3	13	-16	8	31	.	.	13	-27	-5
05	-31	-16	12	13	-11	26	.	-5	8	4	-29	6
06	-33	-5	18	11	-1	46	27	4	11	-15	-27	5
07	-26	-1	22	-6	11	55	15	9	4	-32	-23	21
08	-14	11	17	-13	31	53	.	.	.	-53	-12	33
09	-7	25	8	-13	46	46	-1	.	-31	-52	3	41
10	3	20	4	-4	48	26	11	-28	.	-41	24	40
11	20	17	6	2	51	.	0	-43	-70	-32	41	23
12	29	12	13	12	32	-2	.	.	-78	-4	50	12
13	30	11	19	28	14	10	.	-41	-56	22	47	8
14	24	5	23	35	-4	.	.	-23	-49	.	30	0
15	26	7	40	46	-10	1	.	3	-28	.	16	-24
16	18	.	.	39	-18	-6	0	.	-3	58	5	-38
17	13	5	38	20	-24	.	-3	31	18	37	1	.
18	4	13	41	6	-5	6	.	22	54	11	-29	.
19	1	19	31	6	-11	8	.	37	48	-9	-49	.
20	-1	23	17	1	-12	.	18	22	24	-30	-75	-16
21	6	24	2	3	.	.	39	-1	.	-49	-79	0
22	9	22	-3	7	-7	.	10	-18	-23	-50	-59	24
23	22	18	-2	3	-4	-5	-4	-49	-49	-62	-37	51
24	25	8	-6	-3	0	-1	-15	.	-69	.	-21	52
25	31	4	-1	-9	2	.	-17	.	-79	-13	-9	48
26	30	0	-3	-5	4	.	-36	.	-73	10	1	30
27	24	2	-8	-5	7	.	-48	-34	-53	13	27	12
28	6	-2	.	-6	5	.	-33	.	-28	6	14	3
29	4	-6	-8	5	-2	-9	-15		.	13	-10	-5
30	-4	-6	3	6	-11	.	14		.	18	-20	-10
31	-10	-11		8		-20	10		.		-27	

Dot symbol entry indicates no data available for the day.

BOULDER GEOMAGNETIC SUBSTORM LOG

JUNE 1978

DATE	ONSET TIME	DIR.	COMMENTS
1	0230		Very weak.
	0305		Weak, slow onset.
	0600	≈center	Weak.
	0815	West	
	2140		Sharp onset on H component at mid- and low-latitude stations.
	2225		Network in daylight.
2	0545	West	
	0630	West	
	0730	West	
	0910		Onset of major global magnetic storm. Rapid positive excursions on H component at Midway (45γ), Tahiti (34γ) and Boulder (90γ). Storm continued through 03/0400 UT.
3	0450	East	SS evident at Island Lake, Lynn Lake and mid-latitude stations only.
	0540	East	SS evident at Island Lake, Lynn Lake and mid-latitude stations only.
	0735	≈center	1st of double onset; SS evident at Island Lake, Lynn Lake and mid-latitude stations only.
	0800	≈center	2nd of double onset; SS centered at Lynn Lake; extended from Island Lake to Norman Wells where it was weak.
	0945	West	1st of double onset; SS evident at College, Talkeetna and mid-latitude stations only.
	1030	West	2nd of double onset; SS evident southward of Fort Simpson - Inuvik and mid-latitude stations.
4	1215	West	Response stronger at stations north of auroral oval.
	1340	West	
	≈2000		Gradual onset of disturbed conditions throughout network.
	2340	East	
5	0105	East	1st of multiple onset.
	0135	East	2nd of multiple onset.
	0210	East	3rd of multiple onset.
	0230	East	4th of multiple onset.
	0310	East	5th of multiple onset.
	0455	Centered	Very intense SS.
	0805	West	Strong SS.
6	1045	West	
7	0510	East	1st of double onset and weak.
	0545	East	2nd of double onset and centered near Island Lake.
	1630		Gradual onset of unsettled condition.
8	0400	East	1st of multiple onset.
	0440	East	2nd of multiple onset.
	0500	Centered	3rd of multiple onset.
9	0400	East	Minor SS observed on Fort Churchill chain only.
10	0820		Onset of magnetic storm. Marked increase in H component at mid- and low-latitude stations. Storm continued through 11/1200 UT.
12	1030	West	
	1205	West	
	1525		Network in daylight.
13	0900	West	
14			No SS activity.
15	0445	East	Weak SS; eastward of Lynn Lake to Boulder.
	0645	West	Weak SS.
	0755	West	Centered near Fort Simpson - Norman Wells.
16	0500		Weak SS from Lynn Lake eastward.
	1125		Oval stations only - Norman Wells eastward.
17	0510	East	Weak SS.
	1040	West	
18	0615	≈center	Localized SS; moderate intensity at Back, Island Lake and Lynn Lake.
	0710	≈center	
	1055	West	1st of double onset.
	1145	West	2nd of double onset; moderate intensity along auroral oval stations.
19	0530	East	Weak.
	0620	≈center	SS centered near Lynn Lake.
	1010	West	SS centered near Fort Simpson.
	2200		Network in daylight; SS east of network.
20	0440	East	1st of double onset; SS centered near Lynn Lake.
	0510	East	2nd of double onset; SS centered near Lynn Lake.
21	0315	East	1st of double onset; strong SS centered near Island Lake.
	0340	East	2nd of double onset; strong SS centered near Island Lake.
	0510	≈center	1st of multiple onset.
	0555	≈center	2nd of multiple onset.
	0650	≈center	3rd of multiple onset.
	1130	West	SS centered near College.
	1435	West	1st of double onset and weak.
	1500	West	2nd of double onset and moderate.
22			Field unsettled 21/1600 UT to 22/0600 UT; no distinct onsets.
	0615	East	SS centered near Lynn Lake.
	1050	West	SS centered near Fort Simpson.
23	0825	East	1st of multiple onset.
	0920	≈center	2nd of multiple onset.
	1015	West	3rd of multiple onset.
24			Field generally disturbed 23/1600 UT to 24/1600 UT.
	0530	Centered	Moderate.
	1330	West	Strong; SS centered west of College near Midway.
25	0810	West	Strong; SS centered near Fort Simpson. Field unsettled after 1600 UT.
26	0015	East	
	0435	East	1st of multiple onset.
	0455	East	2nd of multiple onset.
	0515	East	3rd of multiple onset.
	0555	East	
	0725	≈center	1st of multiple onset.
	0740	≈center	2nd of multiple onset.
	0820	≈center	3rd of multiple onset.
	0945	West	Network in daylight; SS from Lynn Lake westward.
	1500		Network in daylight; SS from Lynn Lake westward.
	1550		Network in daylight; SS from Lynn Lake westward.
	1640		Network in daylight; SS from Fort Simpson westward.
	1655		Network in daylight; SS from Fort Simpson westward.
	1810		Network in daylight; SS in Alaska only between College and Arctic Village.
	1820		Network in daylight; SS in Alaska only between College and Arctic Village.
27	0245	East	
	0605	≈center	1st of double onset.
	0645	≈center	2nd of double onset.
	1215		Effect localized between Eskimo Point, Island Lake and Fort Simpson. Strongest response between Back and Lynn Lake. Sachs Harbour and Pelly Bay magnetometers strongly disturbed after 1600 UT.
28	0425	East	
	0850	West	
	1200	West	
	1435		Network in daylight.
29	0950		Sudden positive impulse on H component at low- and mid-latitude stations with 33γ at Boulder.
	2050		Magnetic storm began with SC; strong ring current established. Initial positive H-component deflections were 85γ at Boulder, 28γ at Tahiti and 33γ at Wake.
30			Magnetic storm continued; entire network disturbed between 0500 and 1500 UT; high-latitude activity continued until 2000 UT; lower latitude disturbance subsided at 2000 UT also.

Dot symbol entry indicates no data available for the day.

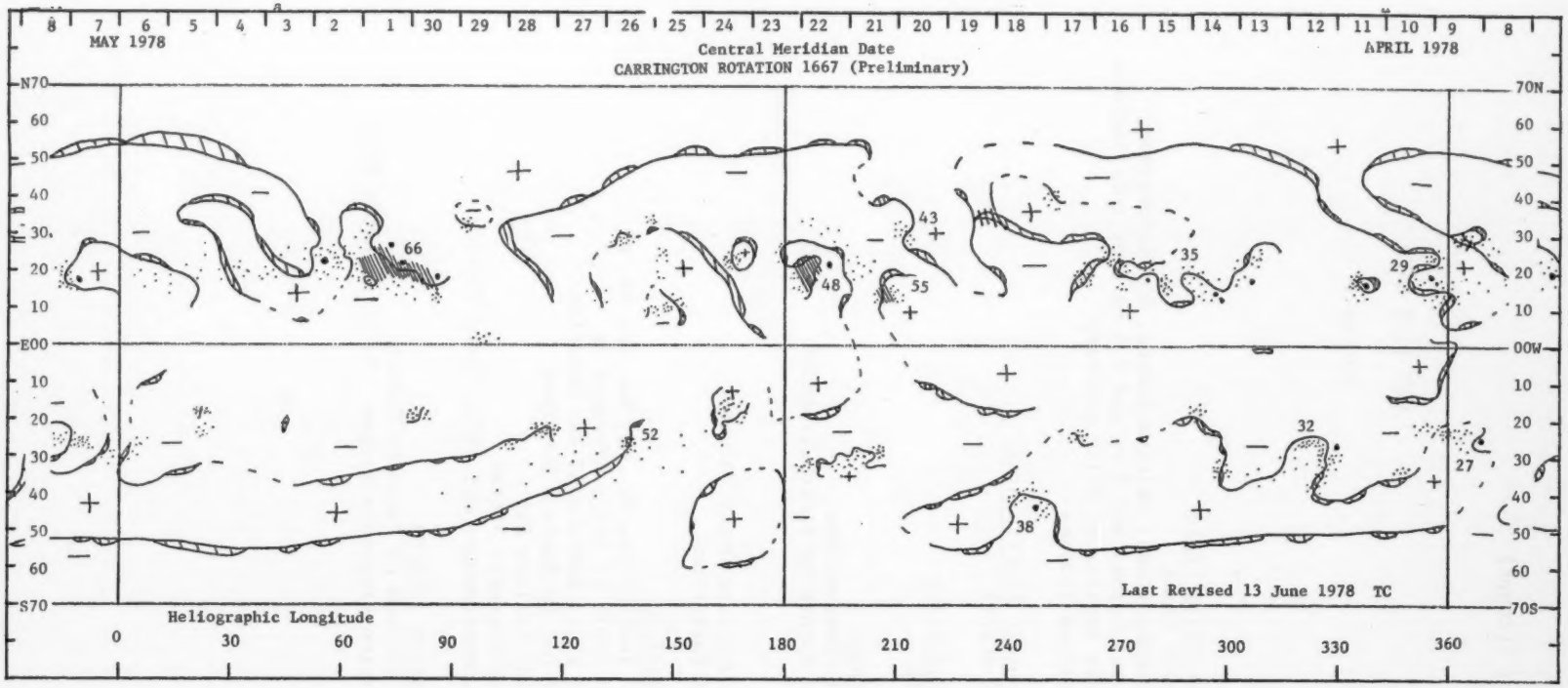
MAY 1978 DATA

Contents

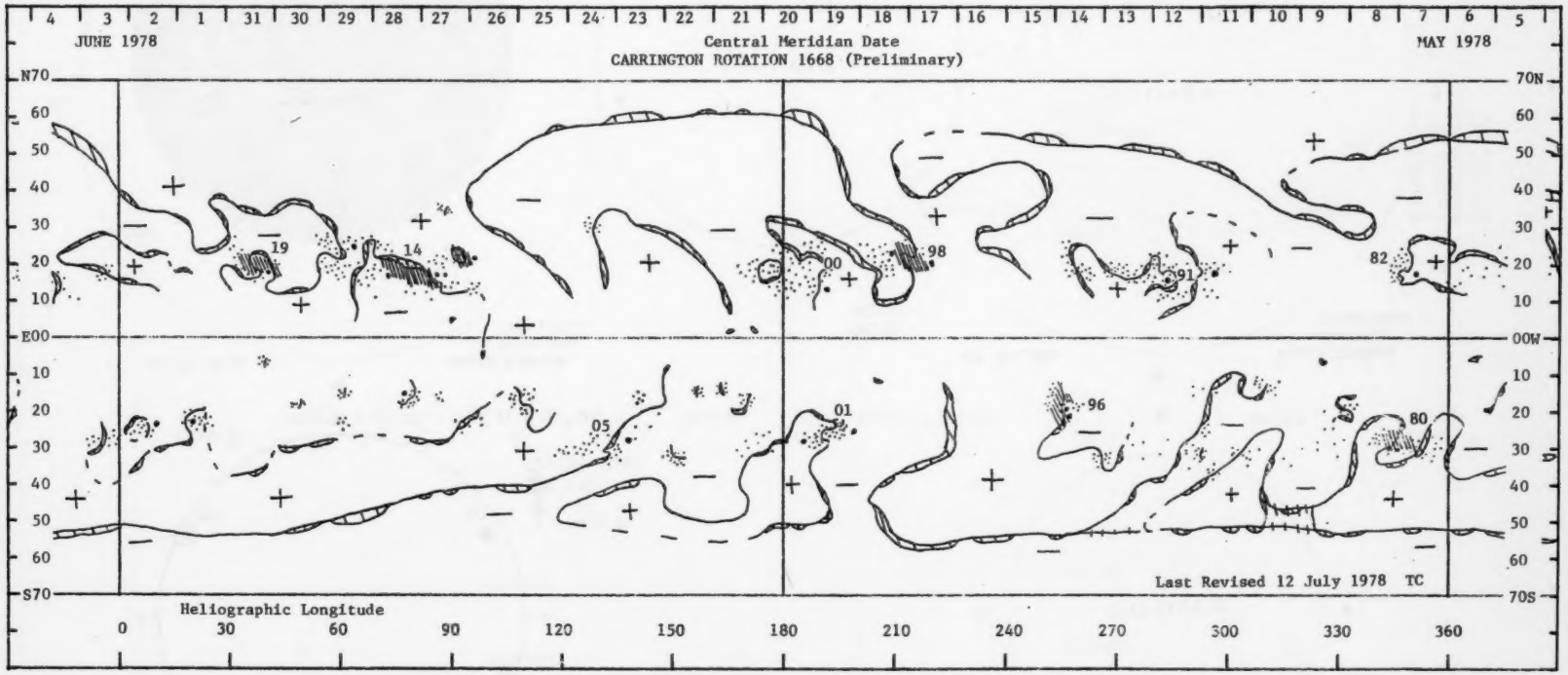
	Page
Daily Solar Activity Center	
Hα Synoptic Chart	44-45
X-ray, Magnetograms, Calcium Plages, Hα Filtergrams, Sunspots, Corona and 2 cm and 8.6 mm Spectroheliograms	46-107
Individual Regions of Solar Activity	108-118
Daily Calcium Indices	118
Sudden Ionospheric Disturbances	
Table of Events	119-122
Solar X-Ray Radiation	
Solrad 11	123-138
Solar Radio Waves	
Spectral Observations	139-150
Selected Events by Radioheliograph	151-154
Cosmic Rays	
Neutron Monitors Daily Values	155
Chart of Variations	156-159
Geomagnetic Indices	
Table of Indices Kp, Kn, Ks, Km, Cp, Ap, aa	160
12-Month Table of Daily Averages Ap	161
Chart of Kp by Bartels 27-day Rotation	162
Chart of Dst by Bartels Rotation	163
Equatorial Indices Dst	164
Principal Magnetic Storms	165
Sudden Commencements and Solar Flare Effects	166
Radio Propagation Indices	
Quality Indices on Paths to Germany	167
Transmission Frequency Ranges - North Atlantic Path	168-169

Hα SYNOPTIC CHART

CARRINGTON ROTATION 1667 (PRELIMINARY)

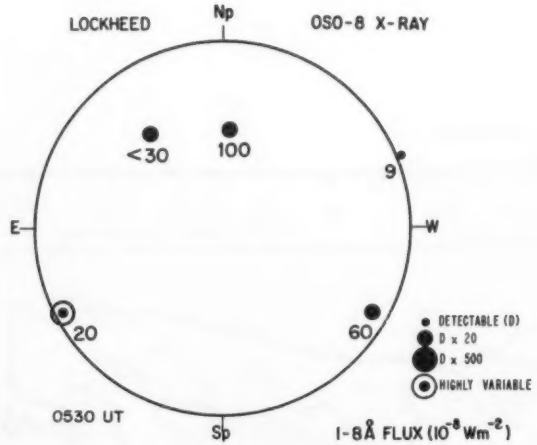


Hα SYNOPTIC CHART
MAY - JUNE 1978



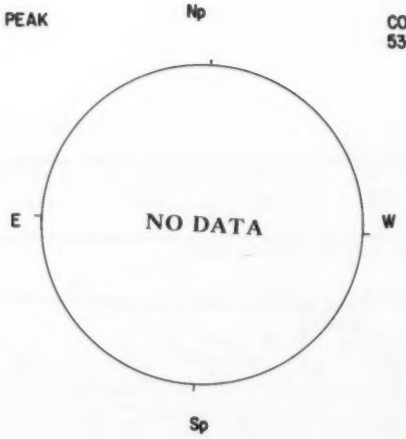
MAY 1, 1978 (P = -24.24, B_0 = -4.17, L_0 = 78.63)

LOCKHEED OSO-8 X-RAY

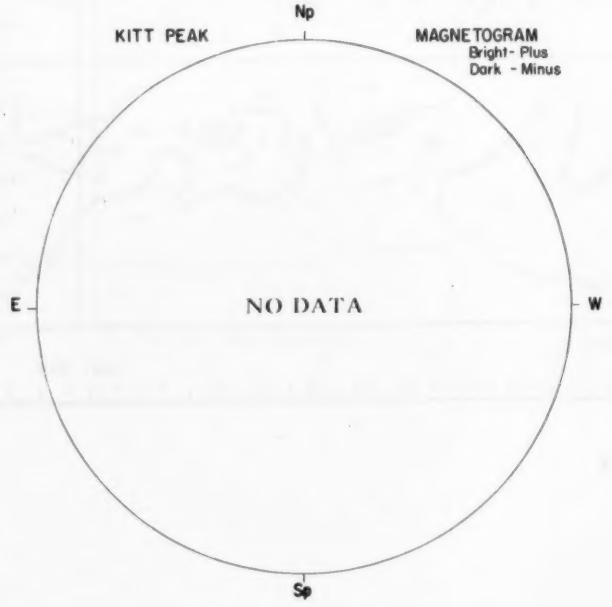


1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

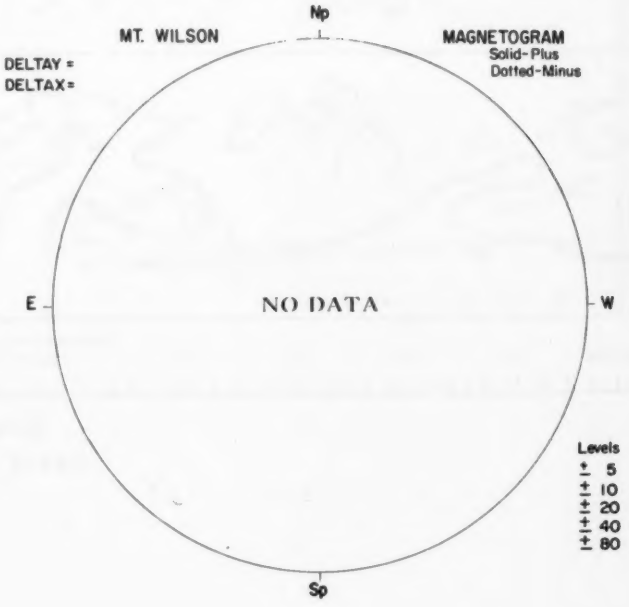


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

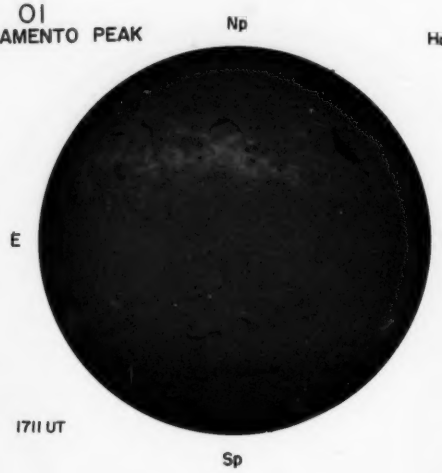


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

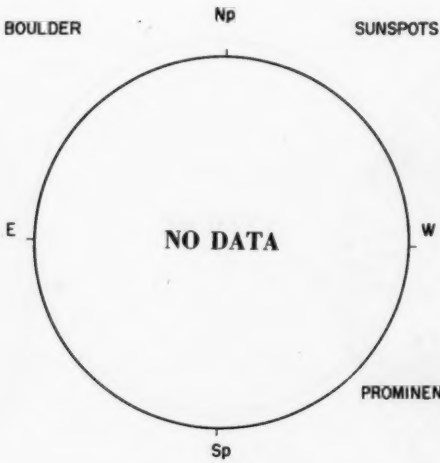


01
SACRAMENTO PEAK



1711 UT

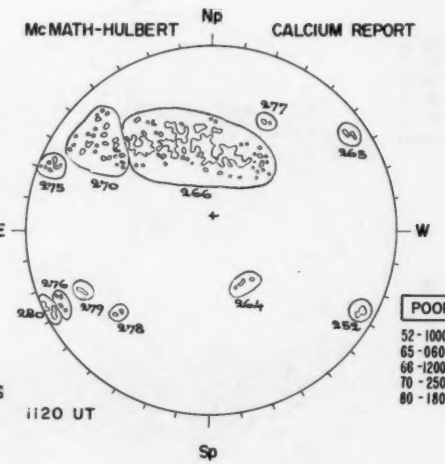
Hα BOULDER



SUNSPOTS

McMATH-HULBERT

CALCIUM REPORT



POOR	D
52 - 1000	- 4.0
65 - 0600	- 2.5
66 - 12000	- 3.5
70 - 2500	- 2.5
80 - 1800	- 3.0

1120 UT

PROMINENCES

NOSC LA POSTA

2.0 CM

----UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

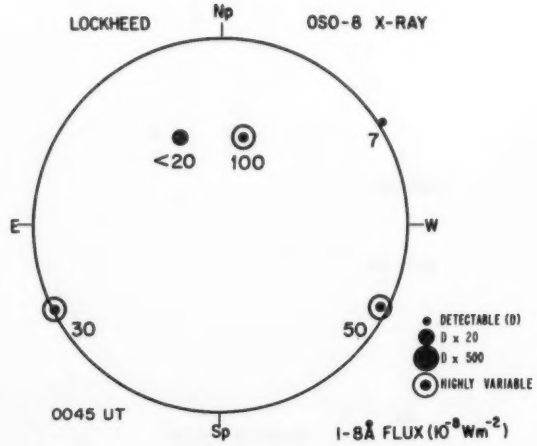
8.6 MM

----UT

Ant. Temp. Unit 100°K

MAY 2, 1978 (P = -24.06, B_o = -4.07, L_o = 65.42)

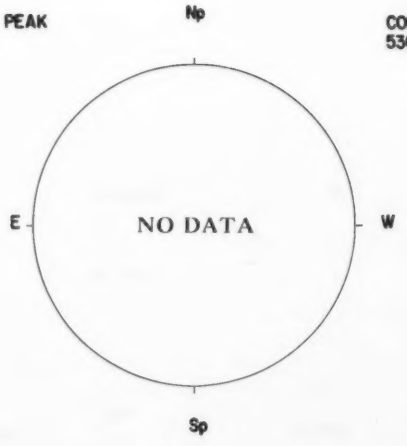
LOCKHEED OSO-8 X-RAY



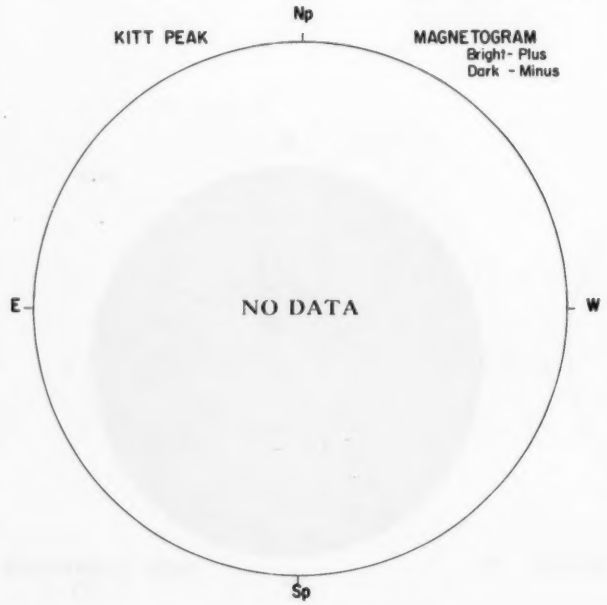
0045 UT

1-8Å FLUX (10^{-8} Wm^{-2})

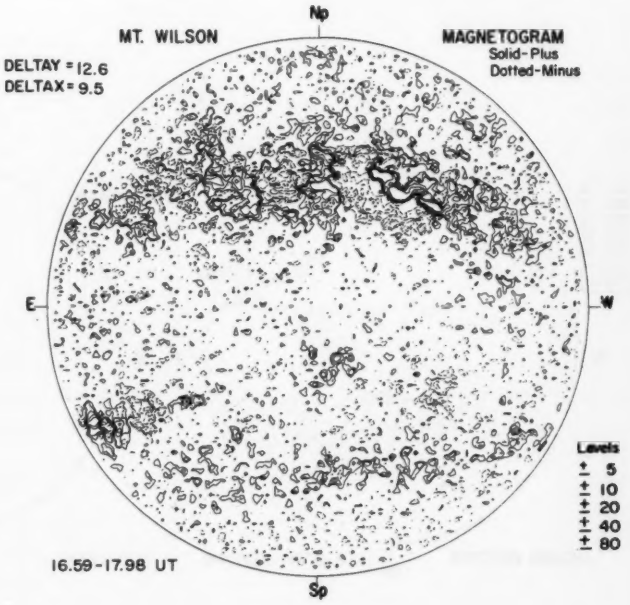
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



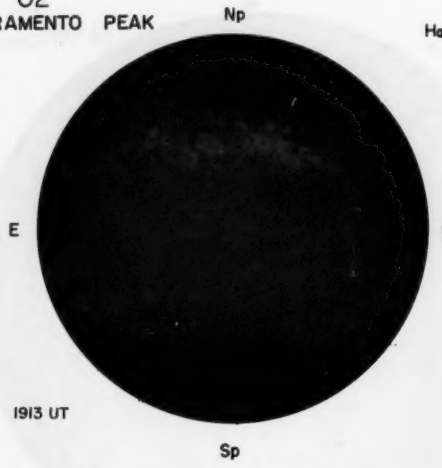
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



16.59 - 17.98 UT

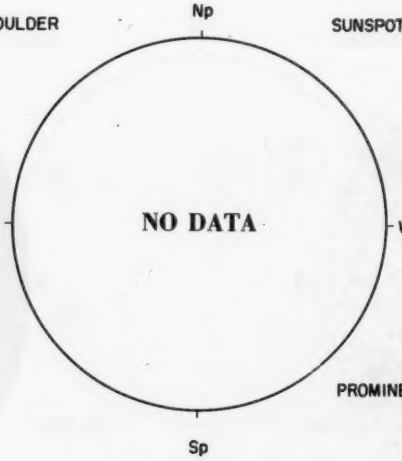
02

SACRAMENTO PEAK



1913 UT

Hα BOULDER

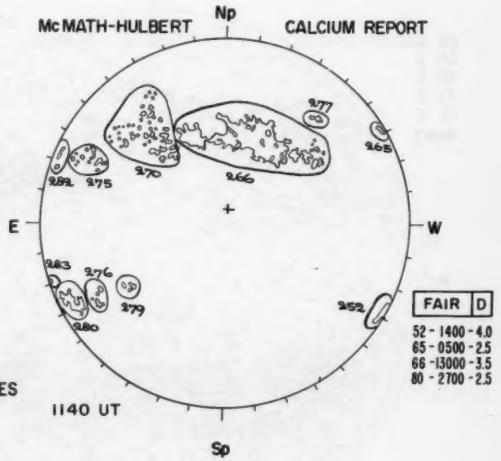


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

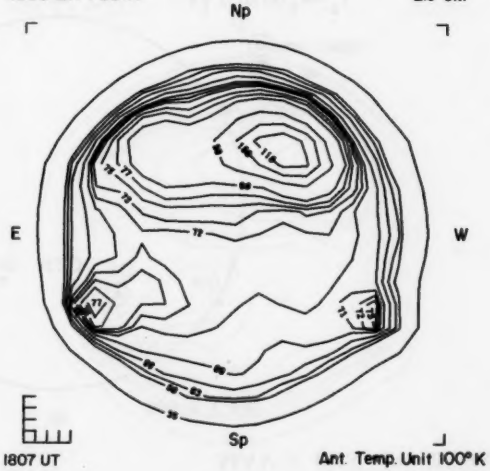


1140 UT

FAIR | D

52 - 1400 - 4.0
65 - 0500 - 2.5
66 - 13000 - 3.5
80 - 2700 - 2.5

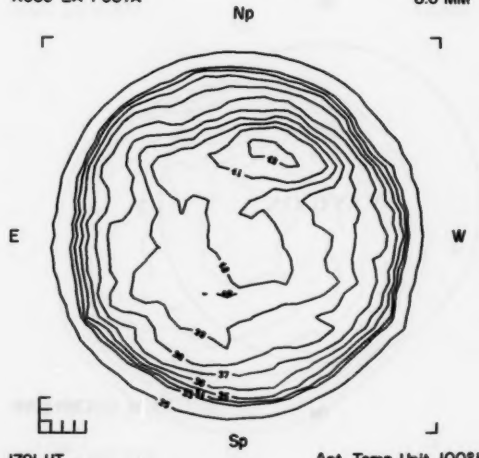
NOSC LA POSTA 2.0 CM



1807 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

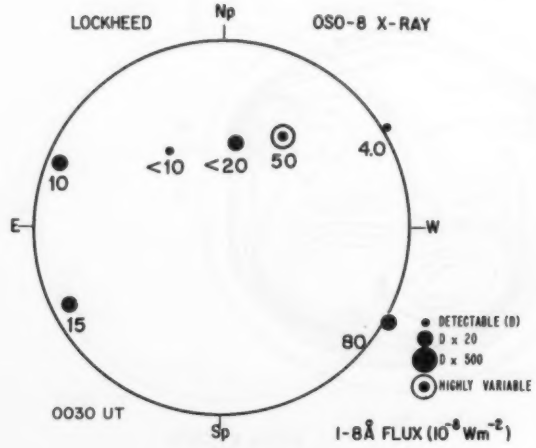


1701 UT

Ant. Temp. Unit 100°K

MAY 3, 1978 (P = -23.88, B_o = -3.97, L_o = 52.20)

LOCKHEED OSO-8 X-RAY

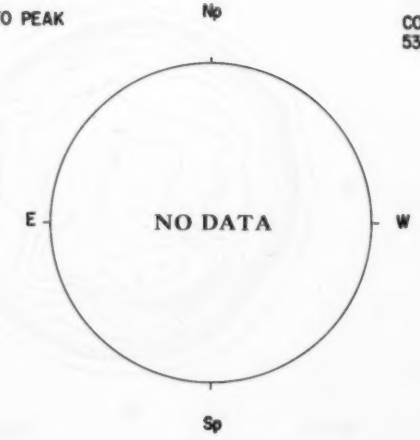


0030 UT

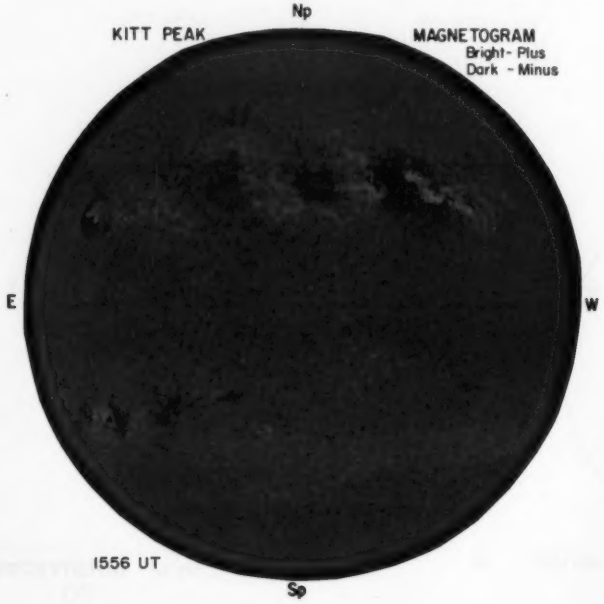
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



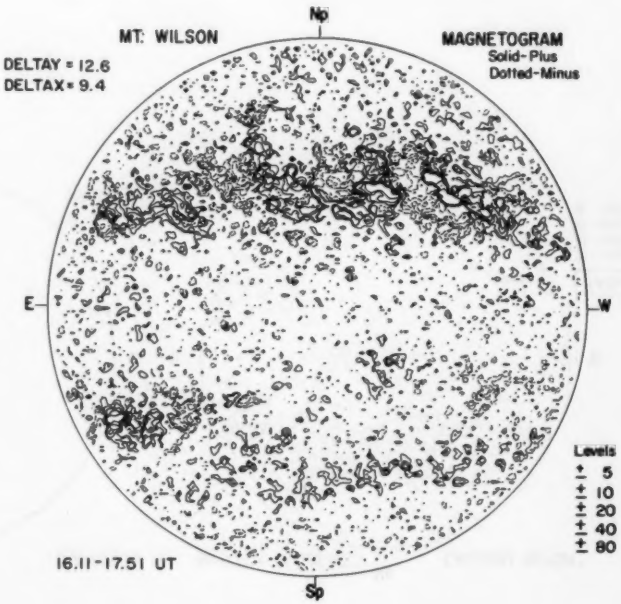
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1556 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.4

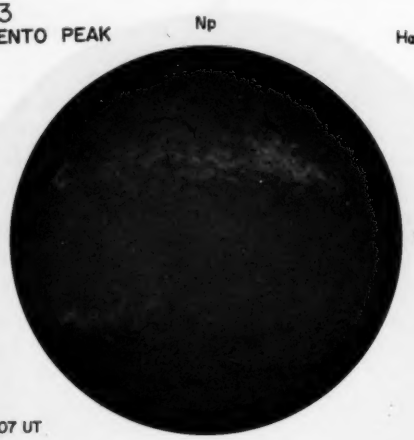


16.11-17.51 UT

Sp

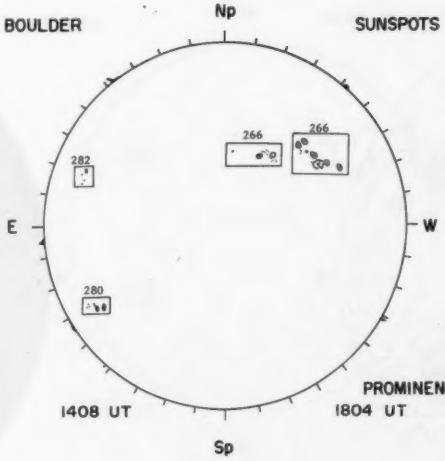
Sp

03
SACRAMENTO PEAK



2107 UT

Hα BOULDER

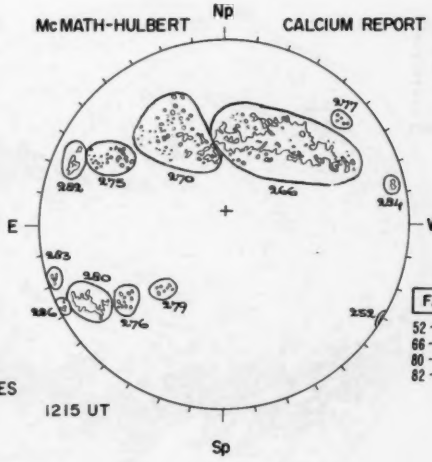


1408 UT

SUNSPOTS

1804 UT

McMATH-HULBERT



1215 UT

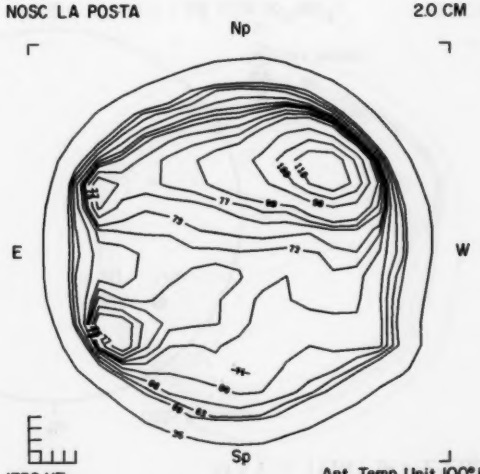
CALCIUM REPORT

FAIR	M

52 - 1200 - 3.0
66 - 12700 - 3.5
80 - 2900 - 2.5
82 - 2100 - 3.0

PROMINENCES

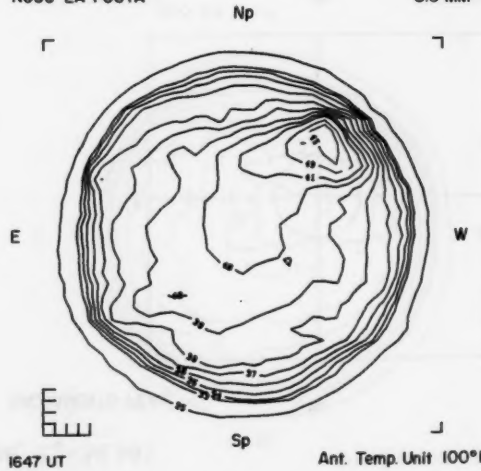
NOSC LA POSTA 2.0 CM



1750 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

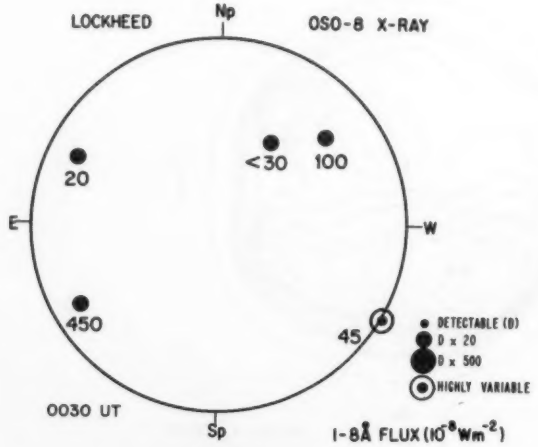


1647 UT

Ant. Temp. Unit 100°K

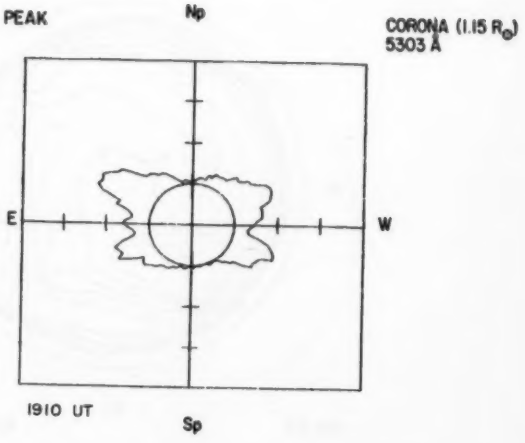
MAY 4, 1978 (P=-23.68, B_o=-3.86, L_o=38.98)

LOCKHEED OSO-8 X-RAY

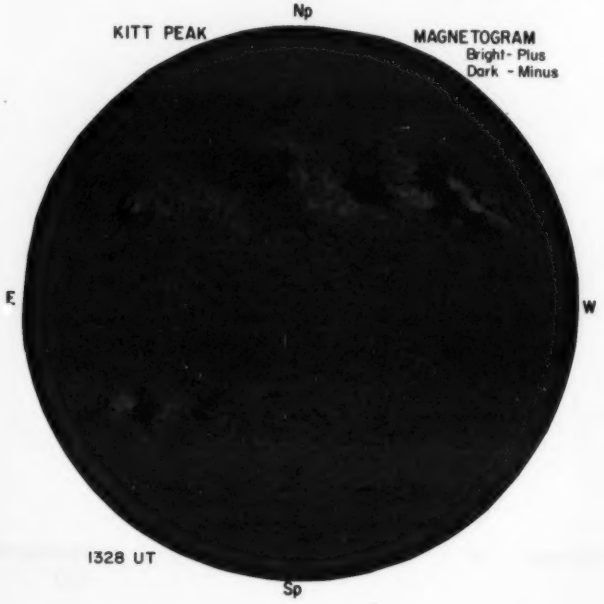


I-8Å FLUX (10^{-8} Wm^{-2})

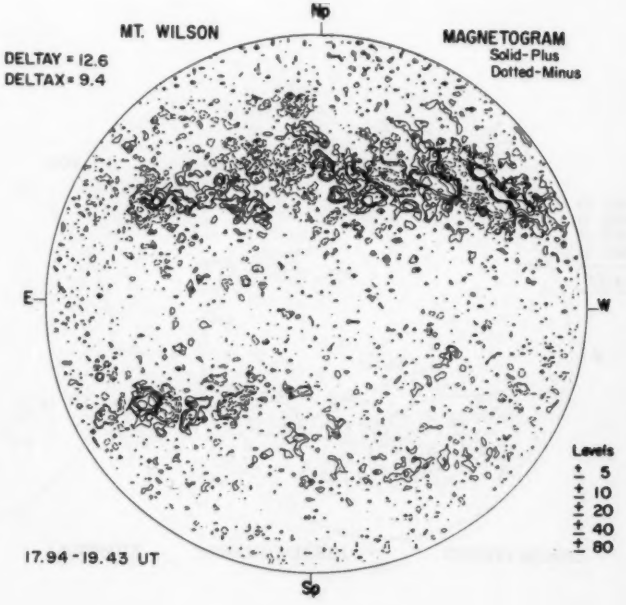
SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

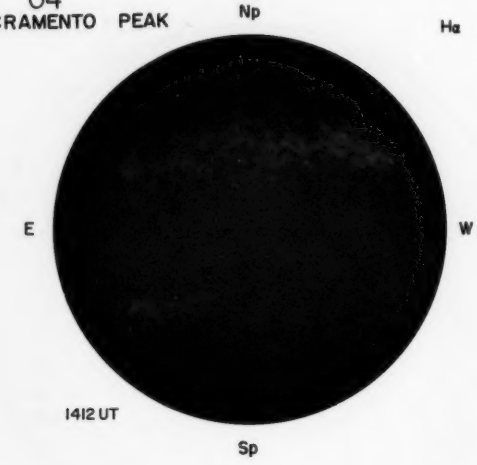


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.4

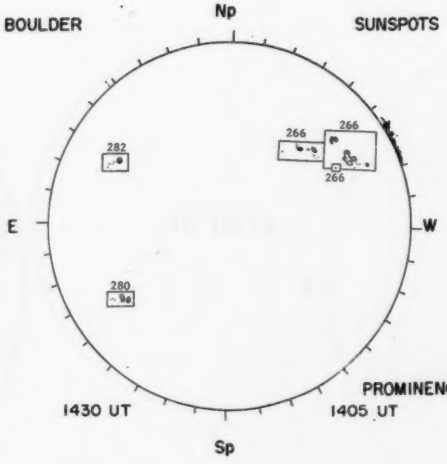


04

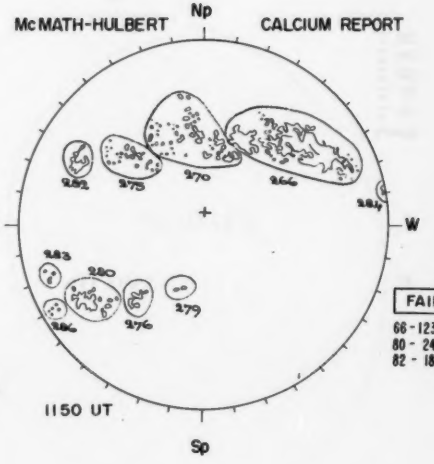
SACRAMENTO PEAK



Hα BOULDER



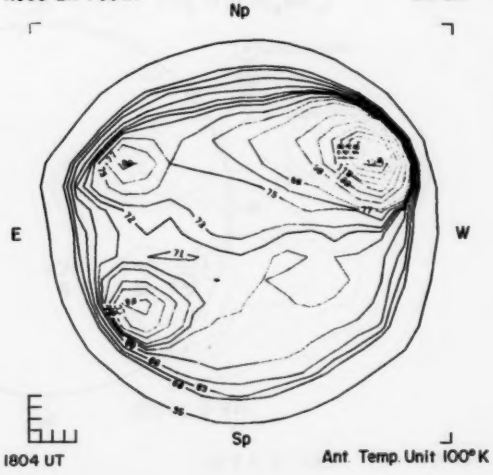
McMATH-HULBERT



FAIR | D

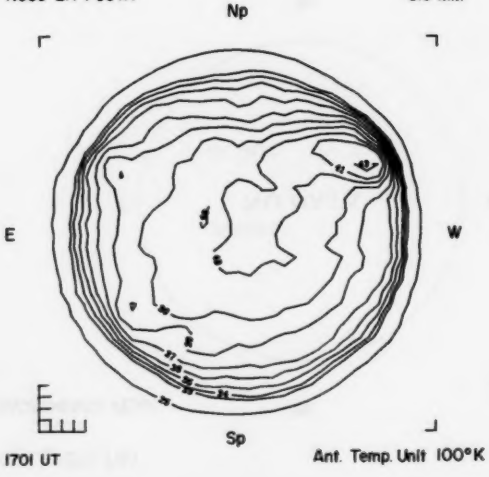
66 - 12300 - 3.5
80 - 2400 - 2.5
82 - 1800 - 3.0

NOSC LA POSTA 2.0 CM



Ant. Temp. Unit 100°K

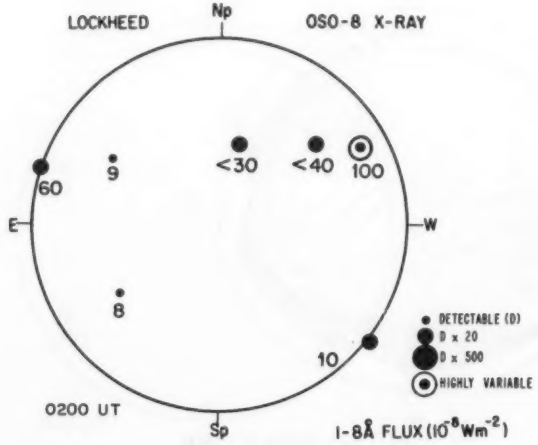
NOSC LA POSTA 8.6 MM



Ant. Temp. Unit 100°K

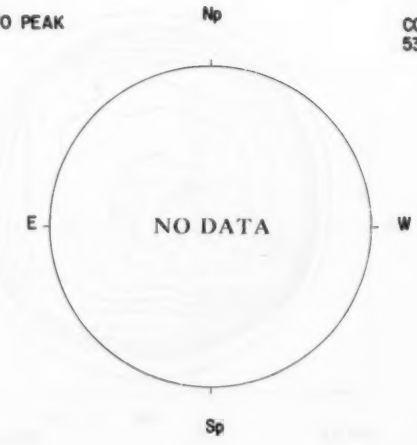
MAY 5, 1978 (P=-23.48, B_o=-3.76, L_o=25.76)

LOCKHEED OSO-8 X-RAY

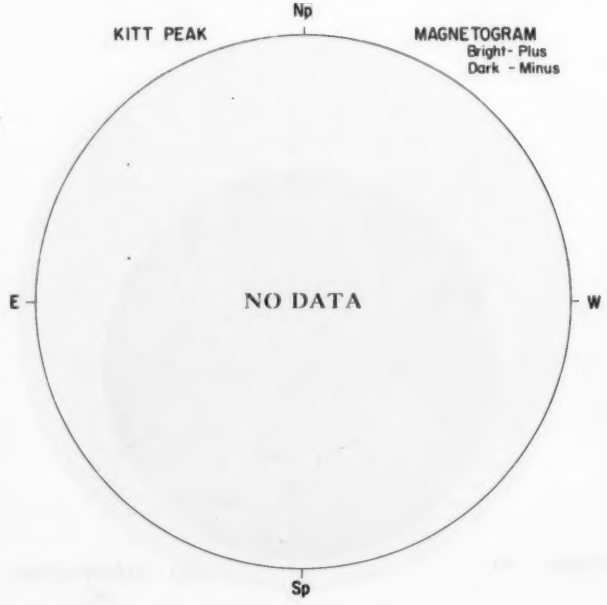


1-8Å FLUX (10^{-8} Wm^{-2})

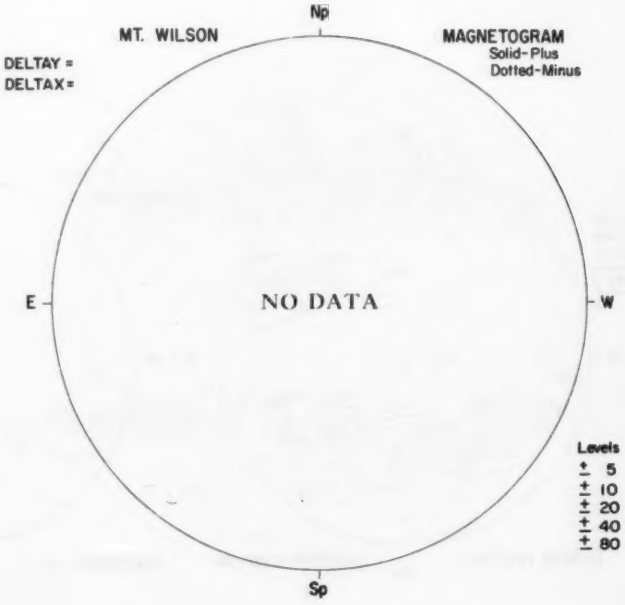
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

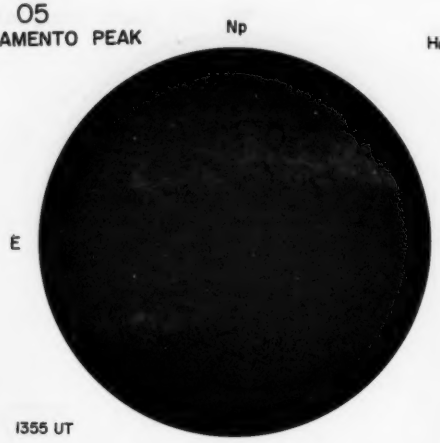


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY =
DELTAX =



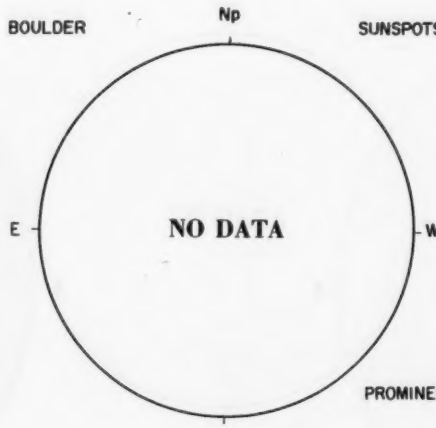
05

SACRAMENTO PEAK



1355 UT

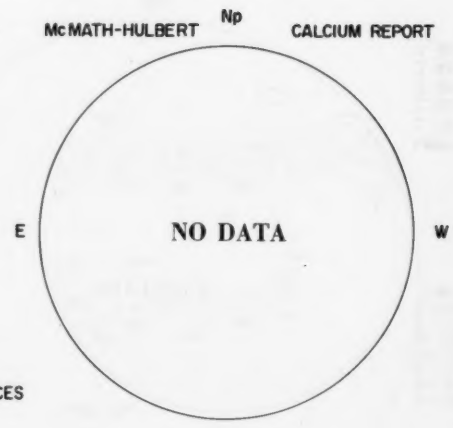
Hα BOULDER



SUNSPOTS

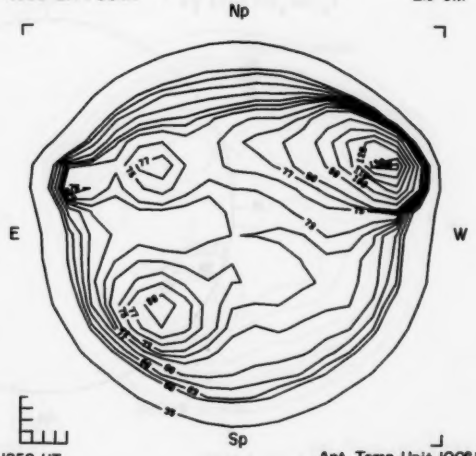
PROMINENCES

McMATH-HULBERT



CALCIUM REPORT

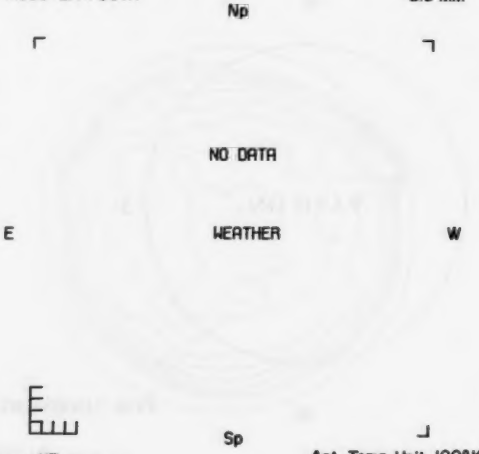
NOSC LA POSTA 2.0 CM



1859 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

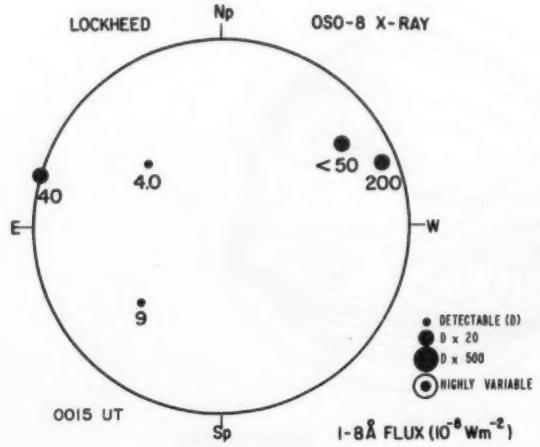


---- UT

Ant. Temp. Unit 100°K

MAY 6, 1978 (P=-23.28, B_o=-3.66, L_o=12.54)

LOCKHEED OSO-8 X-RAY

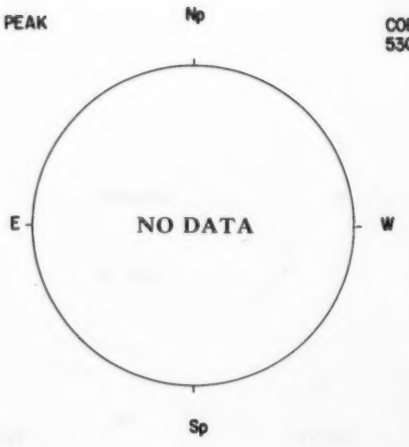


0015 UT

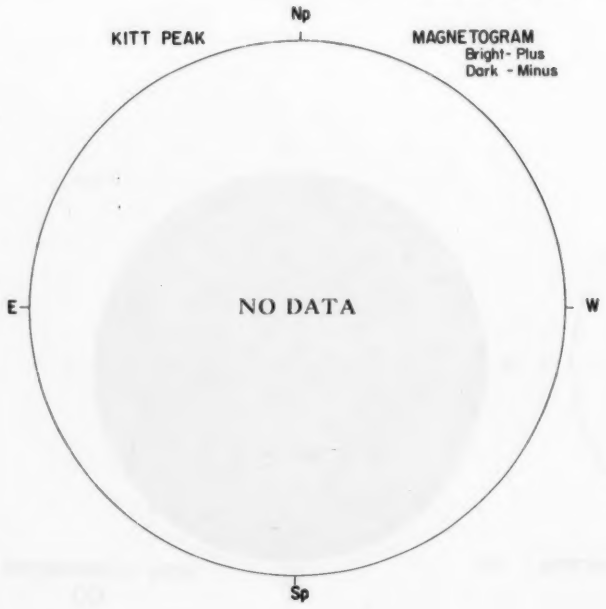
1-8Å FLUX (10^{-6} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

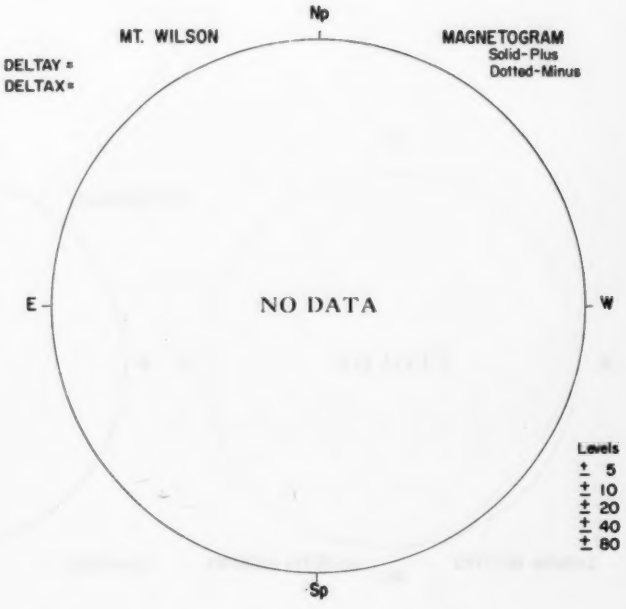


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



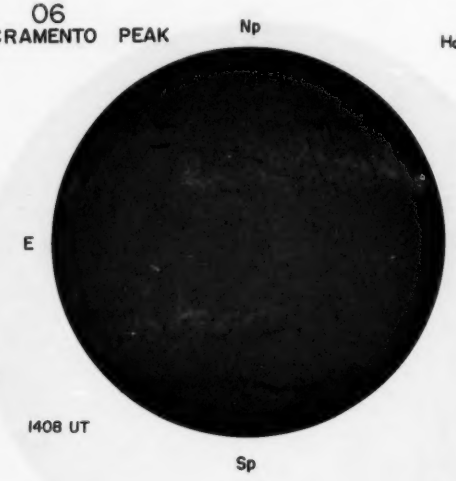
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



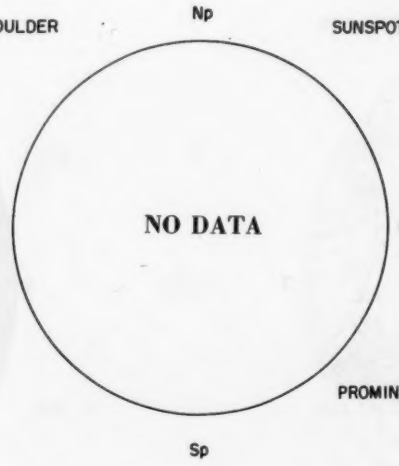
06

SACRAMENTO PEAK



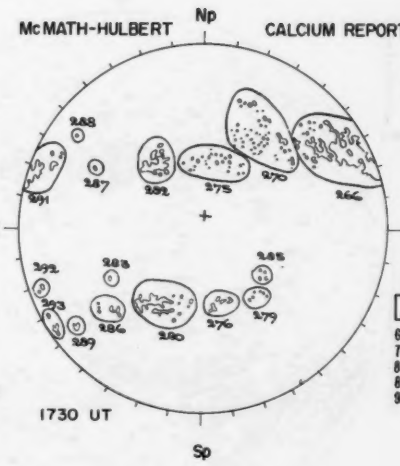
1408 UT

Hα BOULDER



SUNSPOTS

McMATH-HULBERT



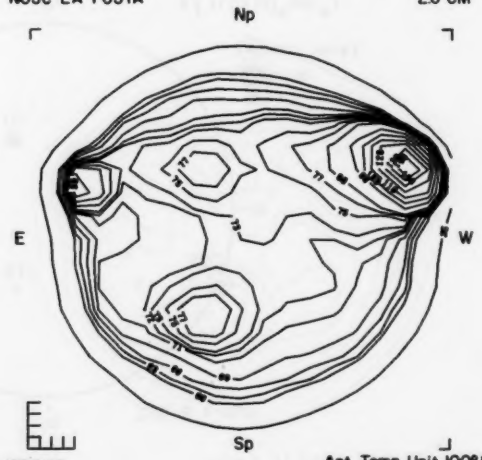
1730 UT

CALCIUM REPORT

PROMINENCES

FAIR	M
66 - 11000 - 3.5	
70 - 2800 - 2.5	
80 - 2300 - 3.0	
82 - 1800 - 2.5	
91 - 3200 - 3.0	

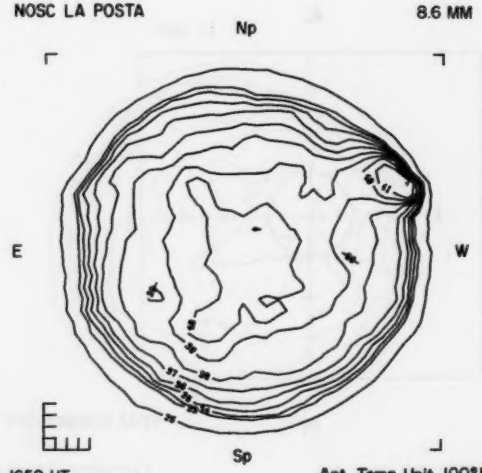
NOSC LA POSTA 2.0 CM



1805 UT

Ant. Temp. Unit 100°K

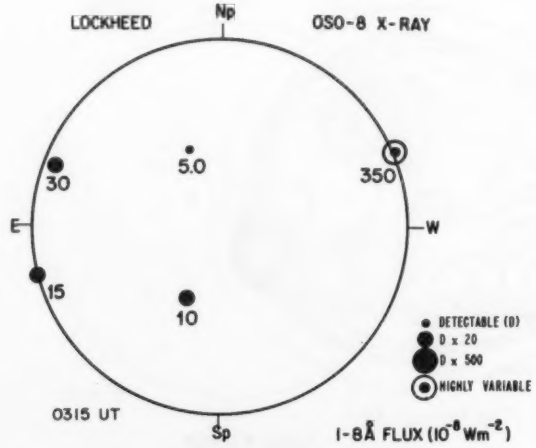
NOSC LA POSTA 8.6 MM

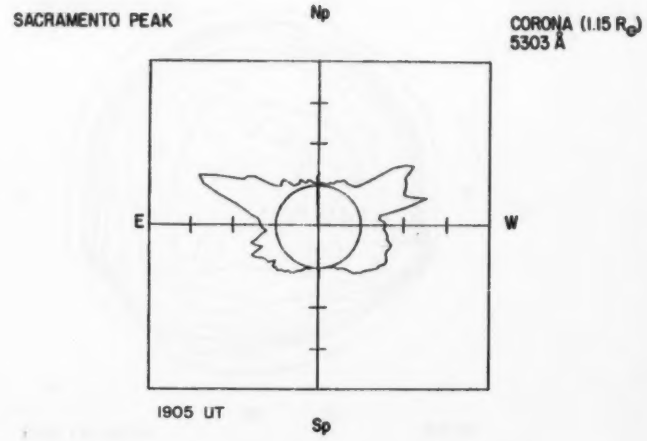


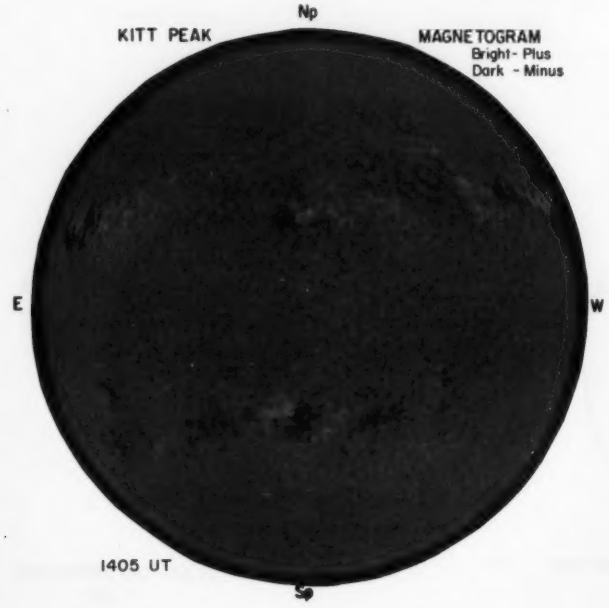
1659 UT

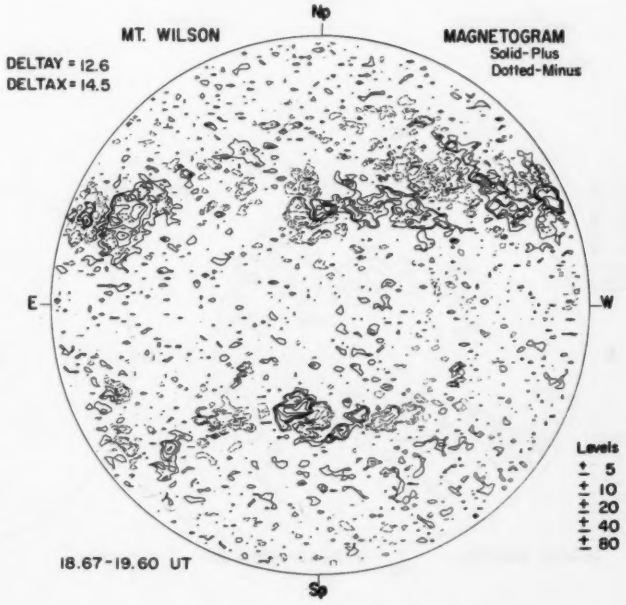
Ant. Temp. Unit 100°K

MAY 7, 1978 (P = -23.06, B_0 = -3.55, L_0 = 359.32)



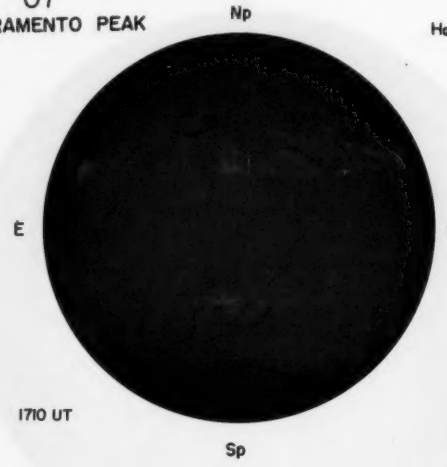




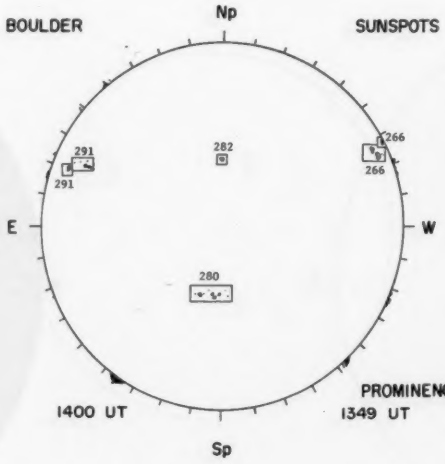


07

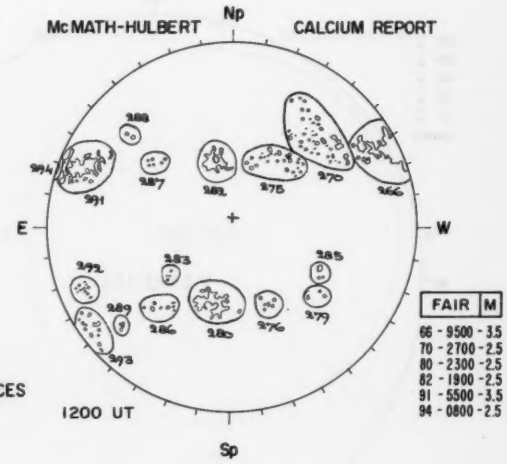
SACRAMENTO PEAK



Hα BOULDER



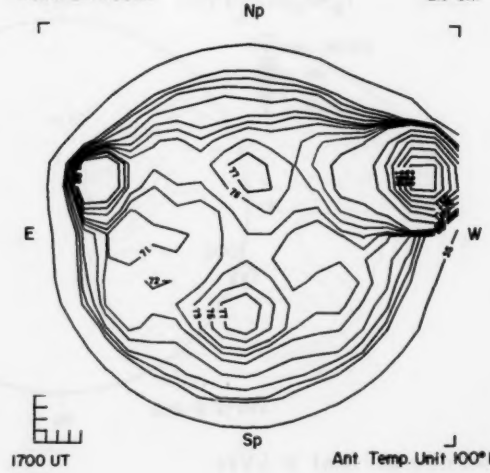
SUNSPOTS



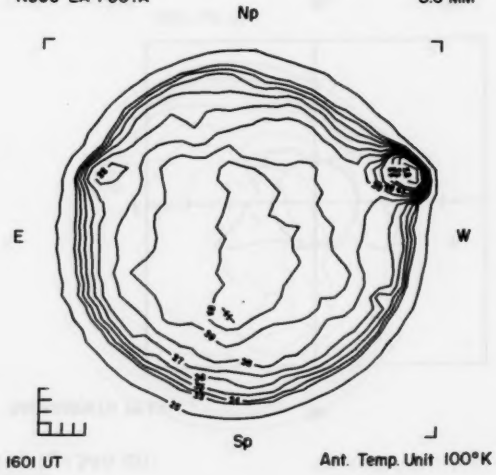
McMATH-HULBERT CALCIUM REPORT

PROMINENCES 1349 UT

NOSC LA POSTA 2.0 CM

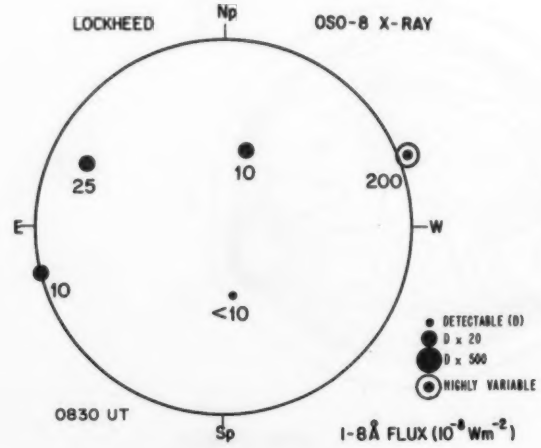


NOSC LA POSTA 8.6 MM



MAY 8, 1978 (P=-22.84, B_o=-3.44, L_o=346.10)

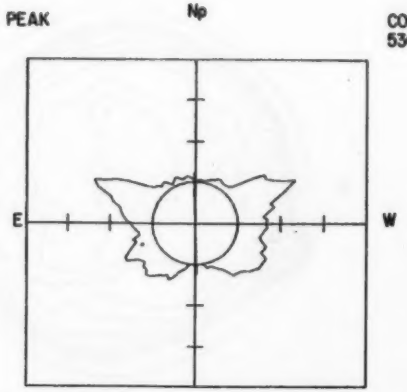
LOCKHEED OSO-8 X-RAY



0830 UT

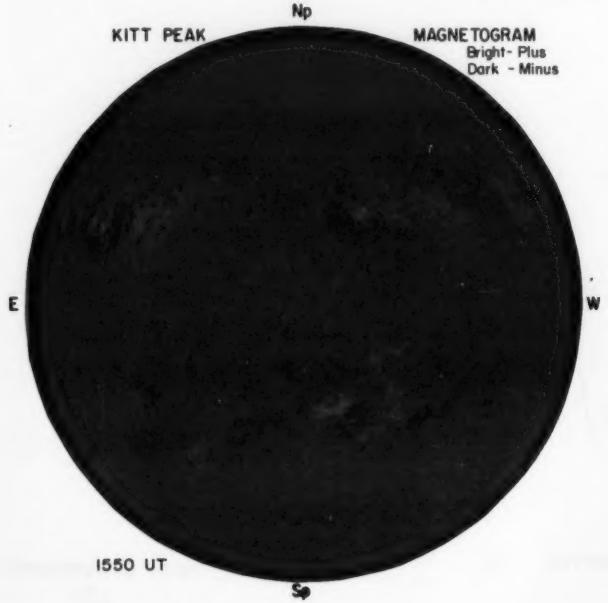
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



1527 UT

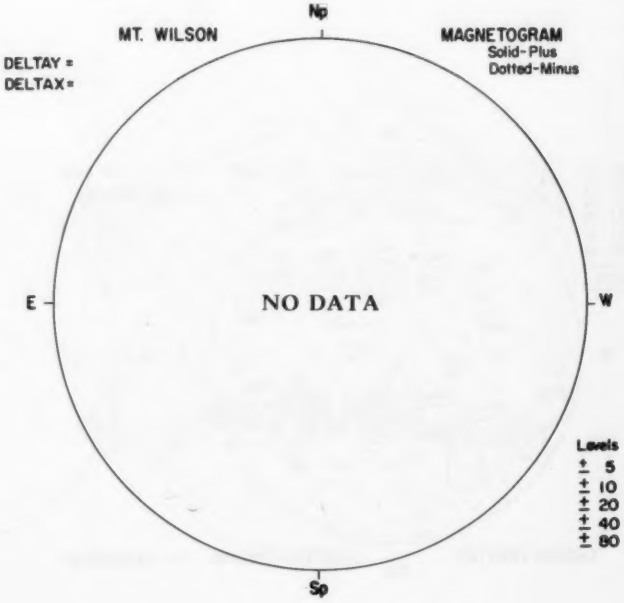
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1550 UT

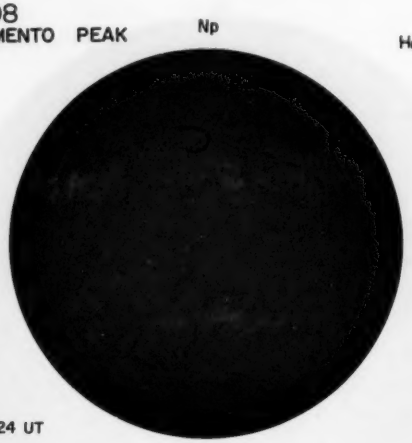
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



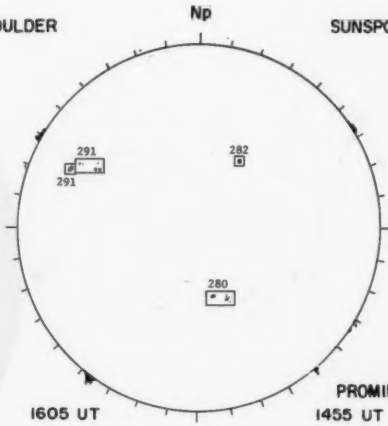
08

SACRAMENTO PEAK



1524 UT

Hα BOULDER



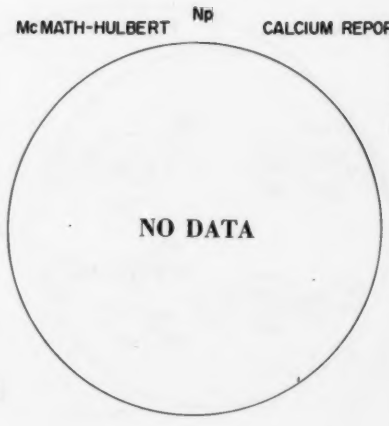
1605 UT

SUNSPOTS

PROMINENCES

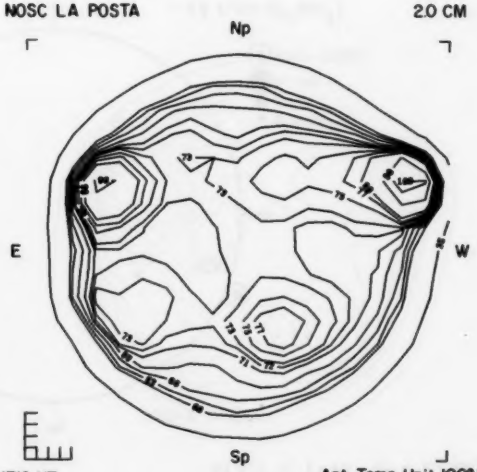
1455 UT

McMATH-HULBERT



CALCIUM REPORT

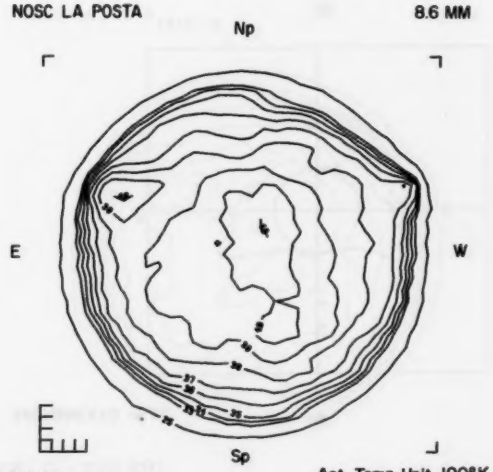
NOSC LA POSTA 2.0 CM



1718 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

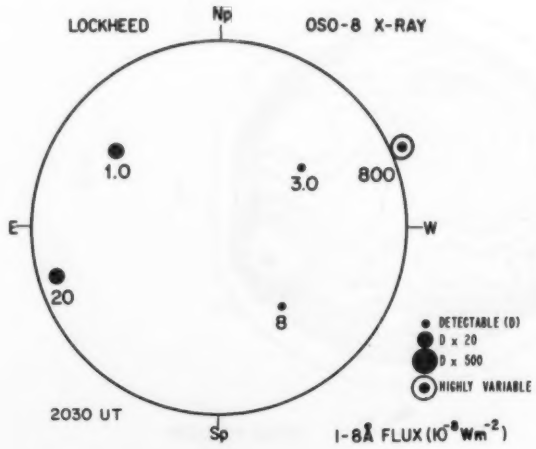


1618 UT

Ant. Temp. Unit 100°K

MAY 9, 1978 (P=-22.61, B_0=-3.33, L_0=332.88)

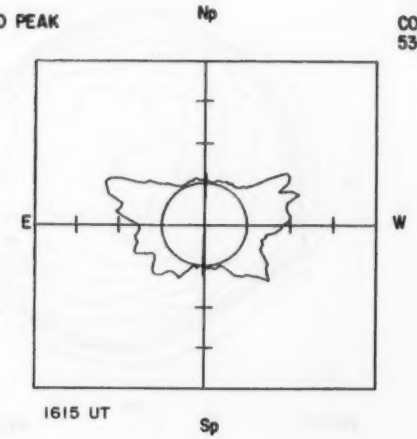
LOCKHEED OSO-8 X-RAY



2030 UT

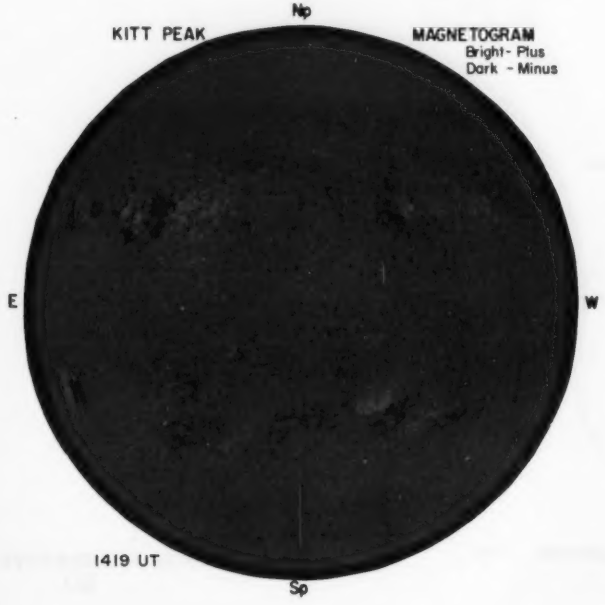
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



1615 UT

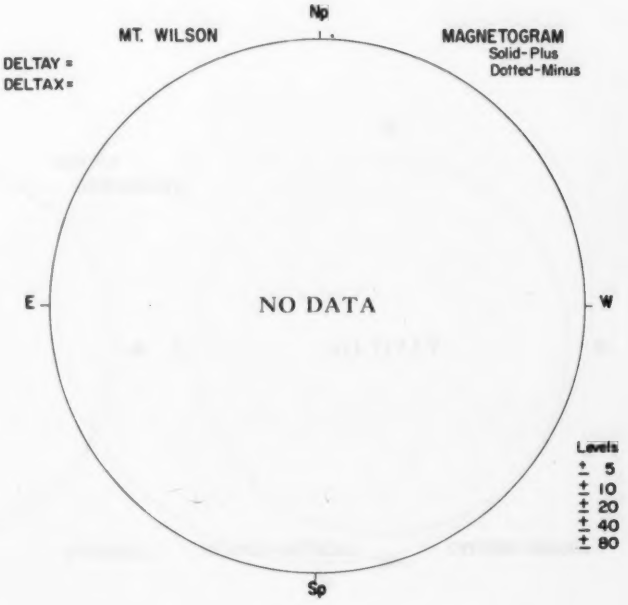
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1419 UT

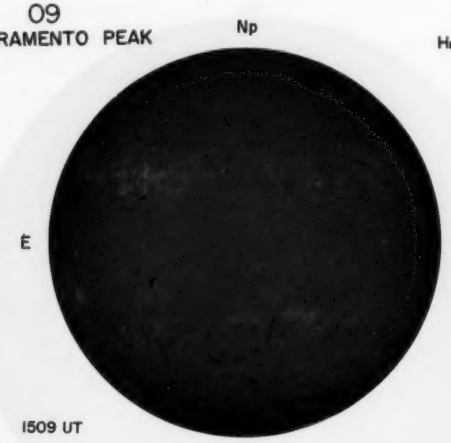
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



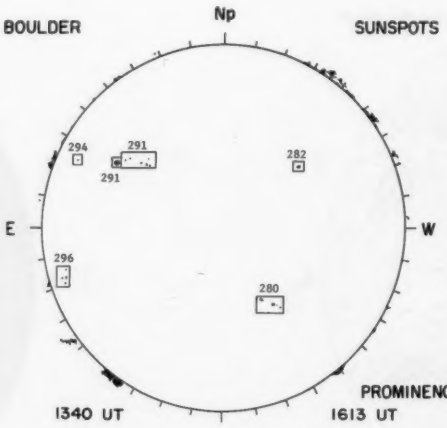
09

SACRAMENTO PEAK



1509 UT

Hα BOULDER



1340 UT

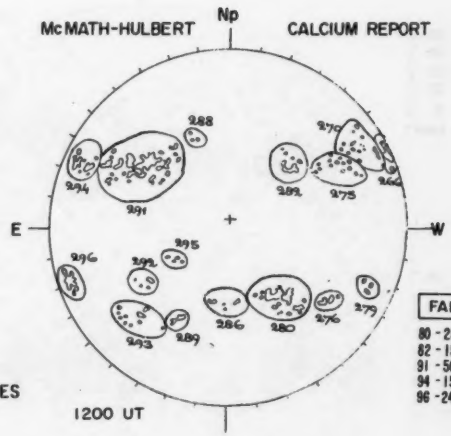
SUNSPOTS

PROMINENCES

1613 UT

McMATH-HULBERT

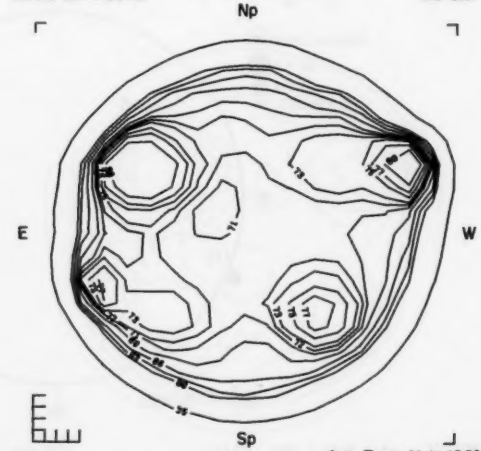
CALCIUM REPORT



1200 UT

FAIR	D
80 - 2500 - 3.0	
82 - 1500 - 2.5	
91 - 5000 - 3.0	
94 - 1500 - 2.5	
96 - 2400 - 3.5	

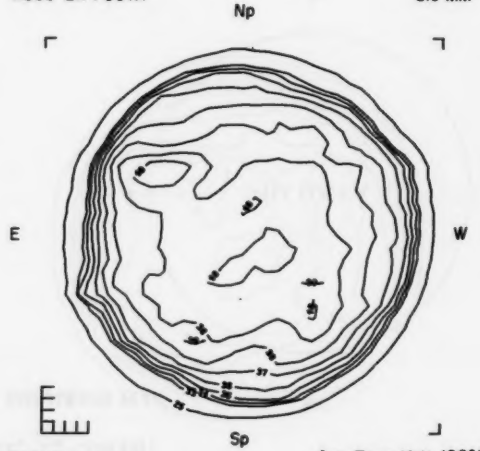
NOSC LA POSTA 2.0 CM



1802 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

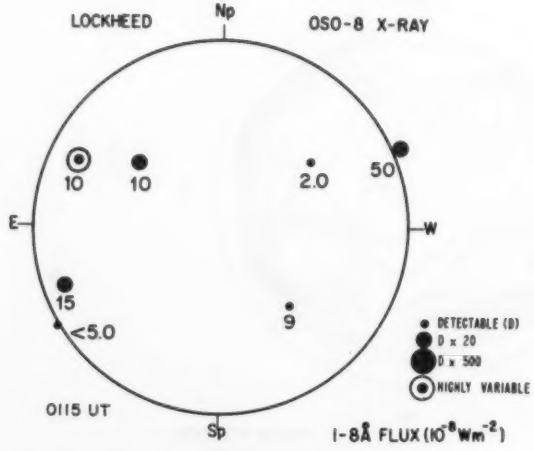


1658 UT

Ant. Temp. Unit 100°K

MAY 10, 1978 (P = -22.38, B_0 = -3.22, L_0 = 319.66)

LOCKHEED OSO-8 X-RAY

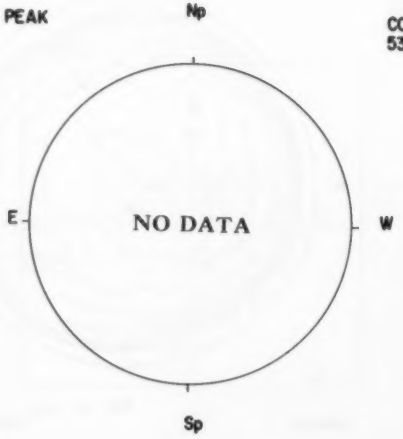


0115 UT

I-8Å FLUX (10^{-8} Wm^{-2})

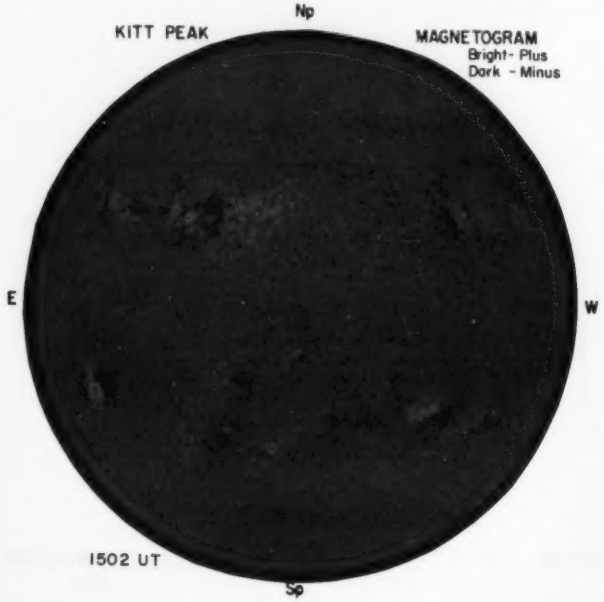
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

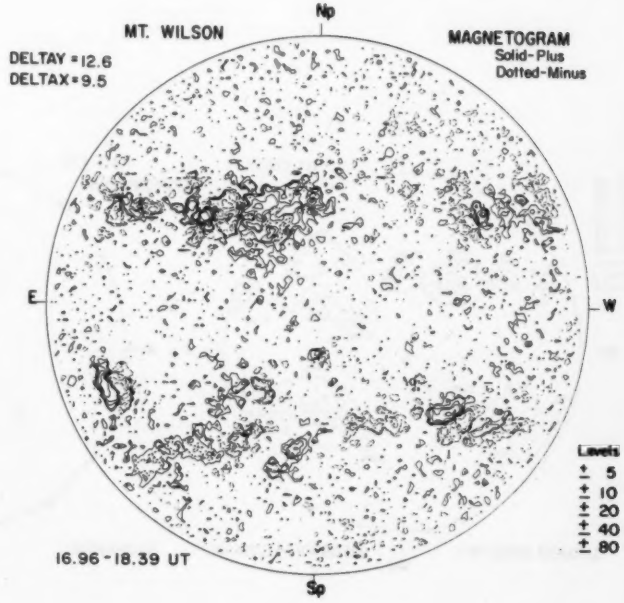


1502 UT

MT. WILSON

DELTAY = 12.6
DELTAX = 9.5

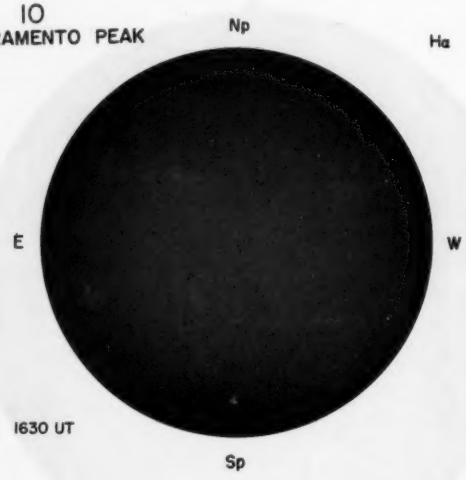
MAGNETOGRAM
Solid - Plus
Dotted - Minus



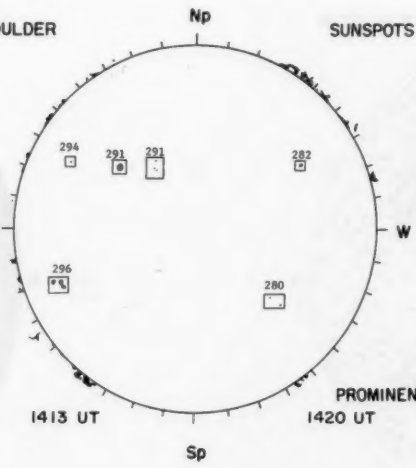
16.96 - 18.39 UT

10

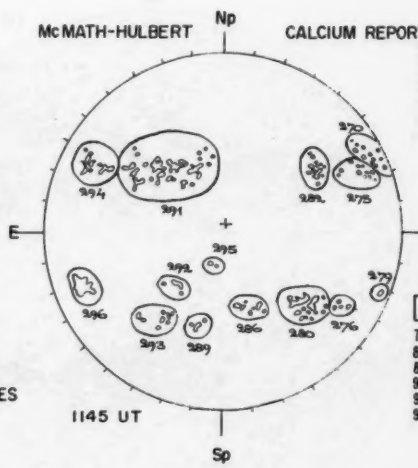
SACRAMENTO PEAK



Hα BOULDER



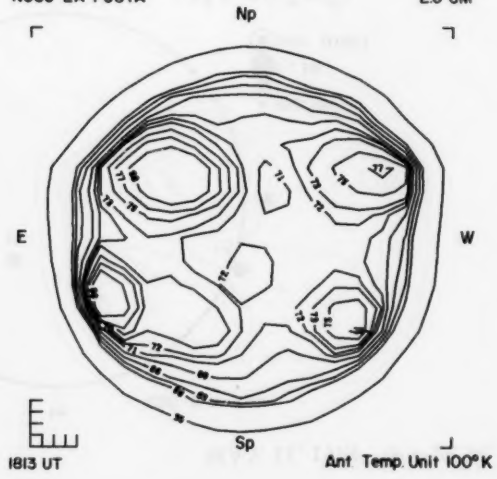
SUNSPOTS



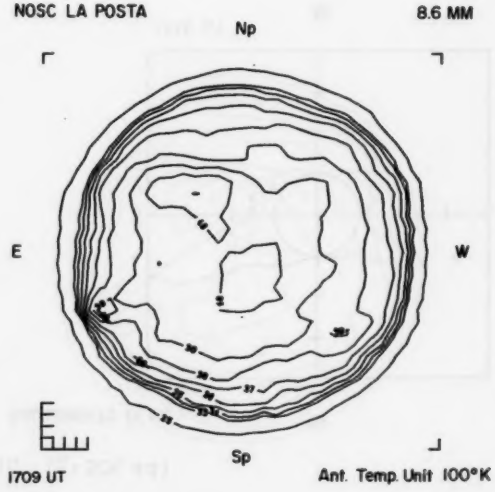
McMATH-HULBERT

CALCIUM REPORT

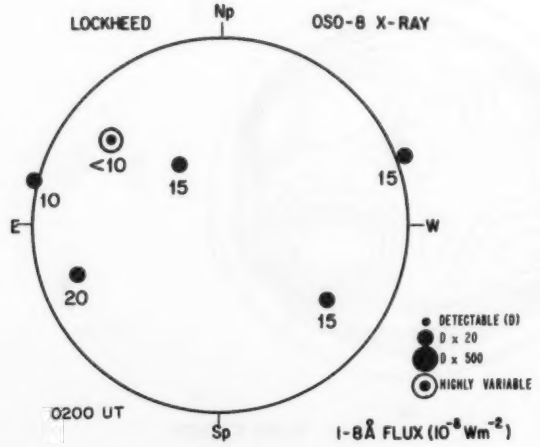
NOSC LA POSTA 2.0 CM

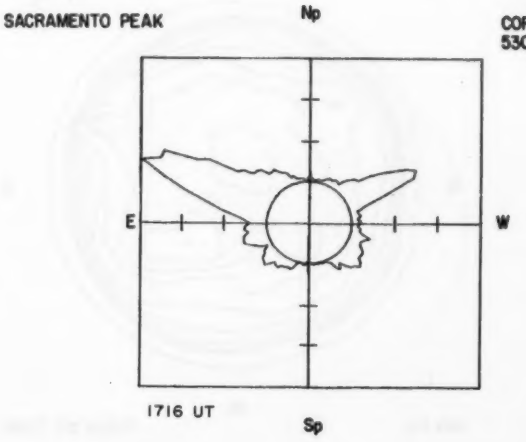


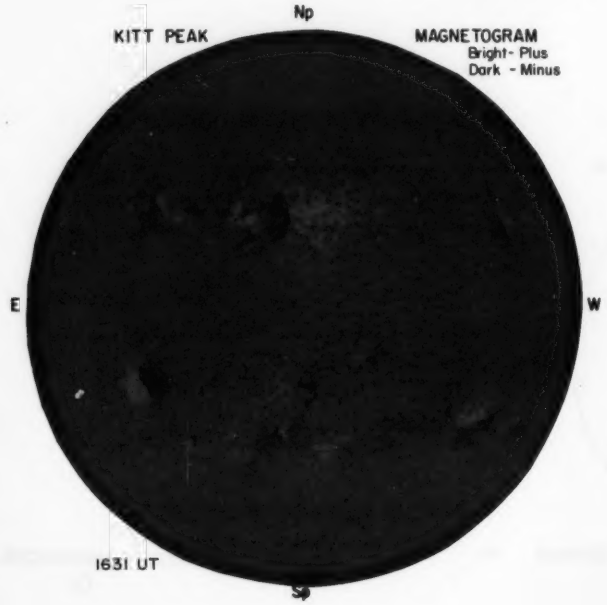
NOSC LA POSTA 8.6 MM

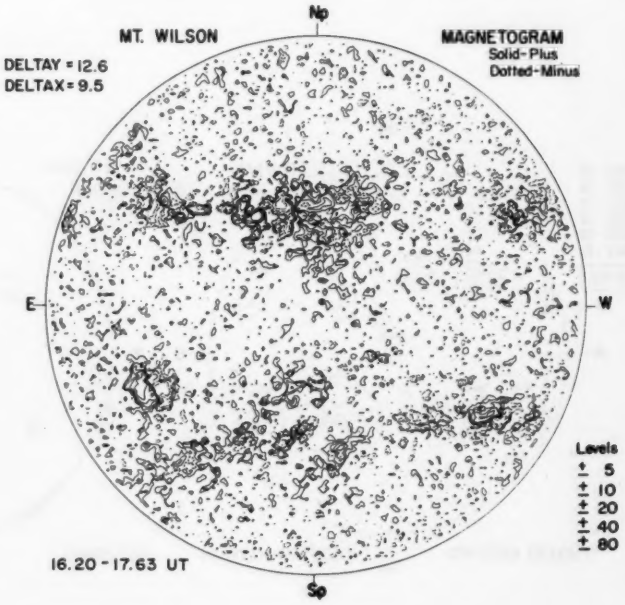


MAY 11, 1978 (P = -22.14, B_o = -3.11, L_o = 306.44)

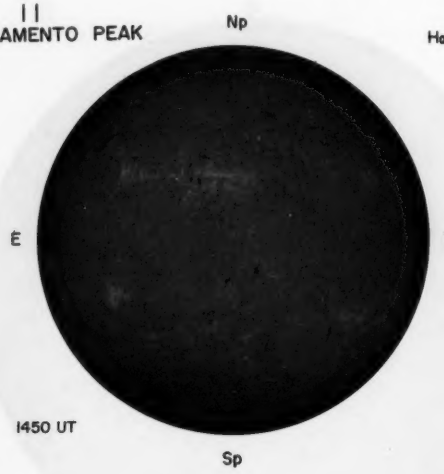






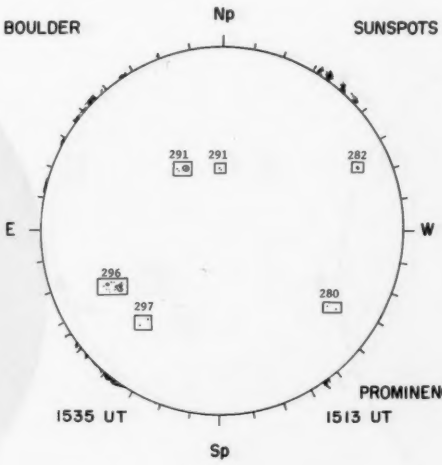


SACRAMENTO PEAK



1450 UT

Hα BOULDER



1535 UT

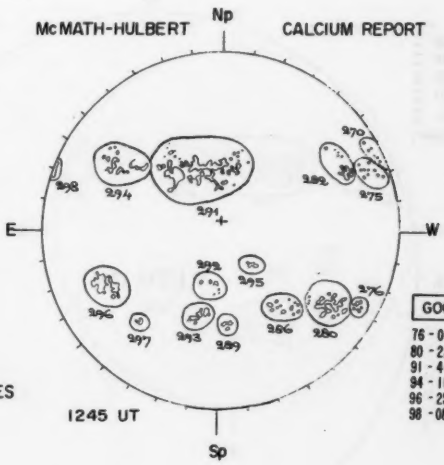
SUNSPOTS

PROMINENCES

1513 UT

McMATH-HULBERT

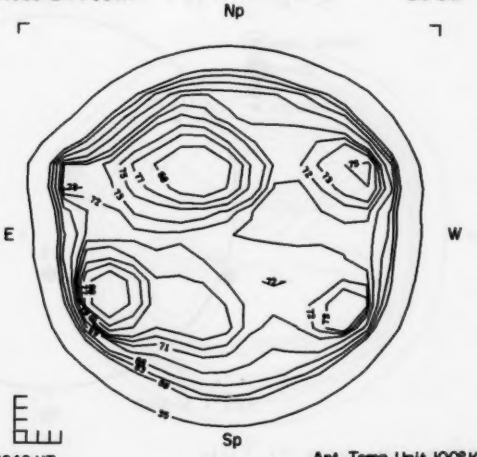
CALCIUM REPORT



1245 UT

GOOD	M
76 - 0400 - 2.5	
80 - 2200 - 2.5	
91 - 4400 - 3.0	
94 - 1600 - 3.0	
96 - 2500 - 3.5	
98 - 0800 - 3.5	

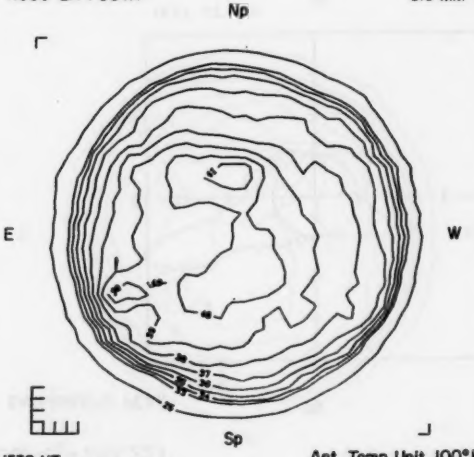
NOSC LA POSTA 2.0 CM



1646 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

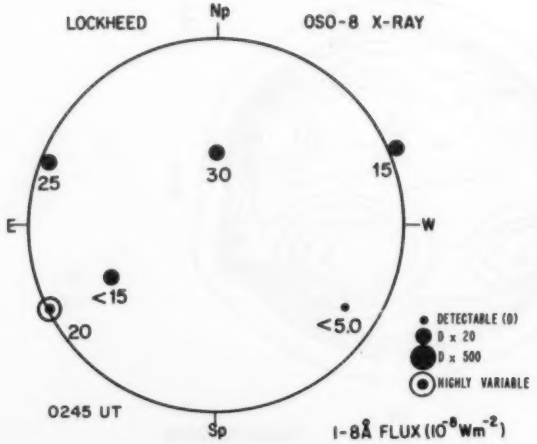


1539 UT

Ant. Temp. Unit 100°K

MAY 12, 1978 (P = -21.89, B_o = -3.00, L_o = 293.22)

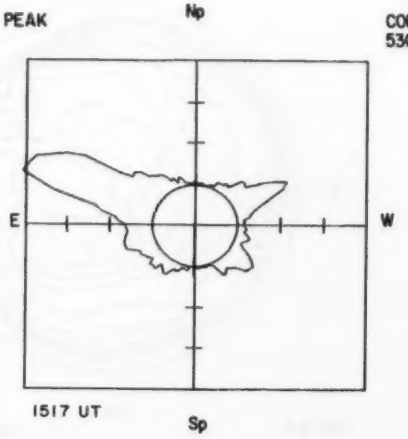
LOCKHEED OSO-8 X-RAY



0245 UT

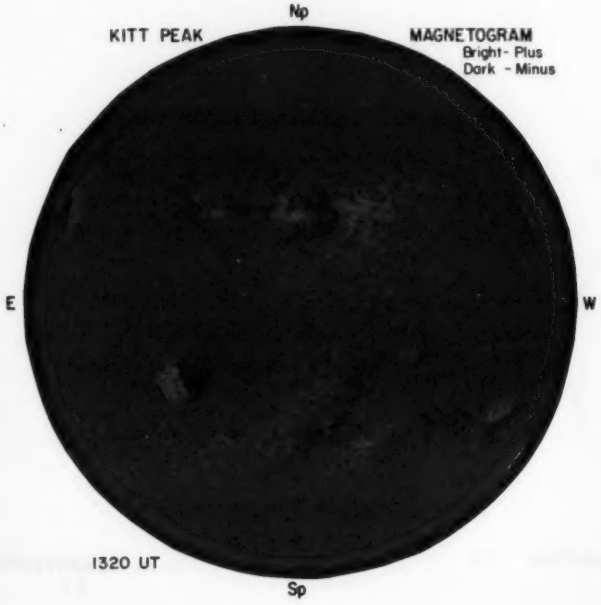
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



1517 UT

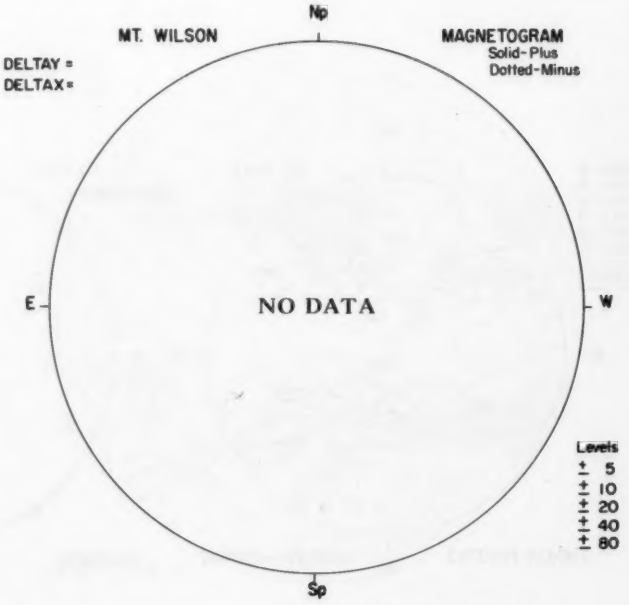
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1320 UT

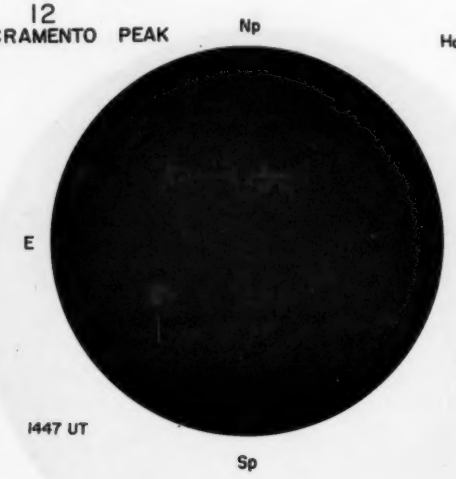
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



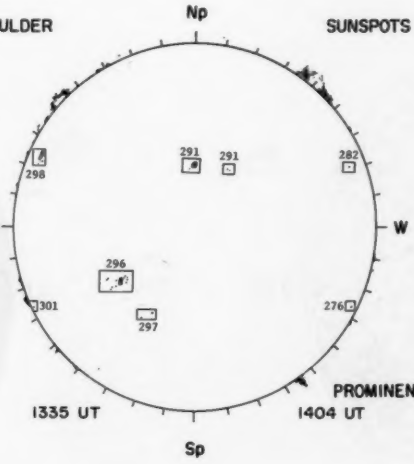
12

SACRAMENTO PEAK



1447 UT

Hα BOULDER



1335 UT

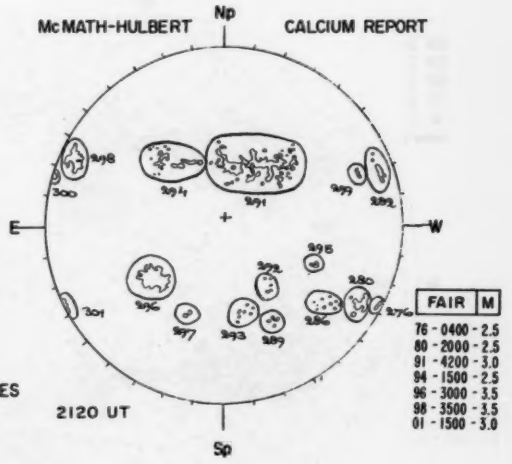
SUNSPOTS

PROMINENCES

1404 UT

McMATH-HULBERT

CALCIUM REPORT

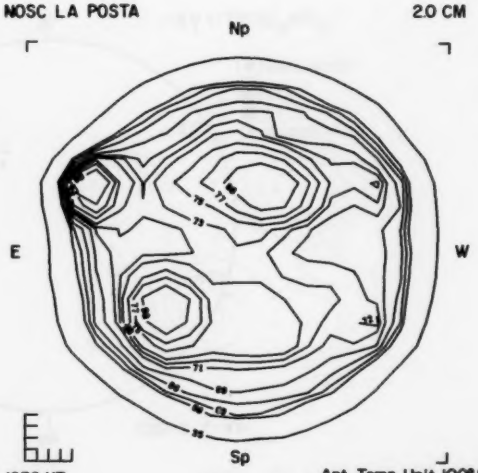


2120 UT

FAIR | M

76 - 0400 - 2.5
80 - 2000 - 2.5
91 - 4200 - 3.0
94 - 1500 - 2.5
96 - 3000 - 3.5
98 - 3500 - 3.5
01 - 1500 - 3.0

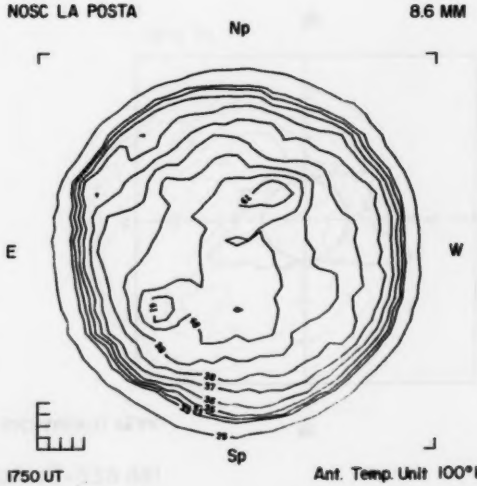
NOSC LA POSTA 2.0 CM



1930 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



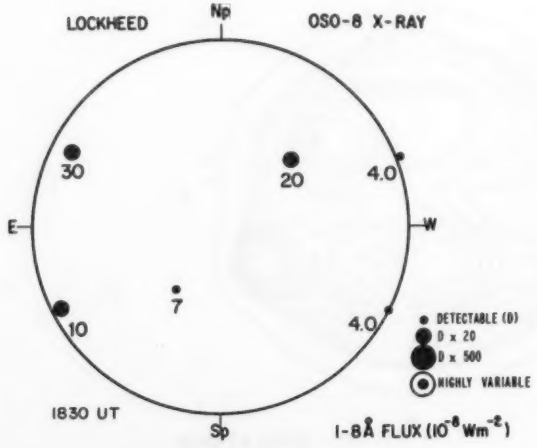
1750 UT

Ant. Temp. Unit 100°K

69
May 78

MAY 13, 1978 (P=-21.63, B_o=-2.89, L_o=279.99)

LOCKHEED OSO-8 X-RAY

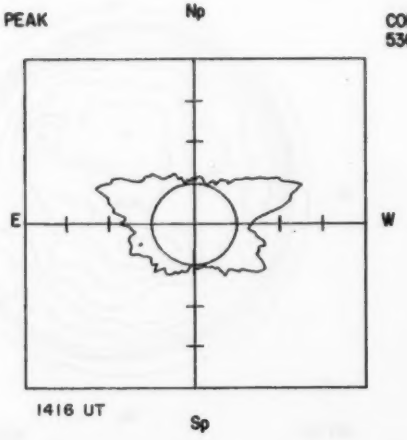


1830 UT

1-8Å FLUX (10^{-8} Wm^{-2})

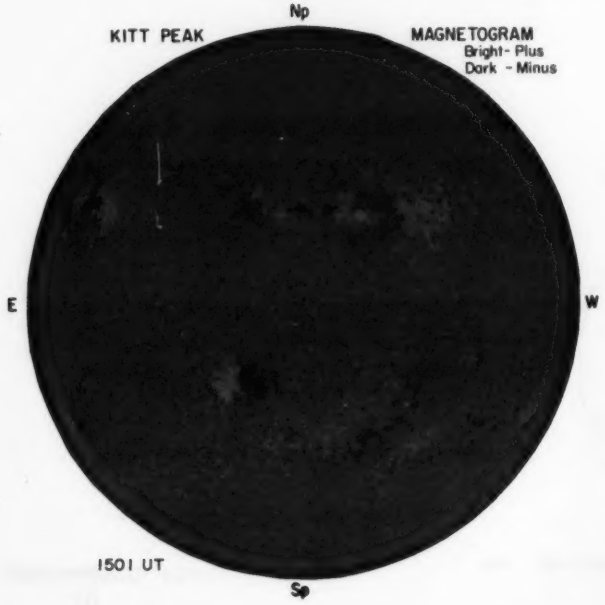
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



1416 UT

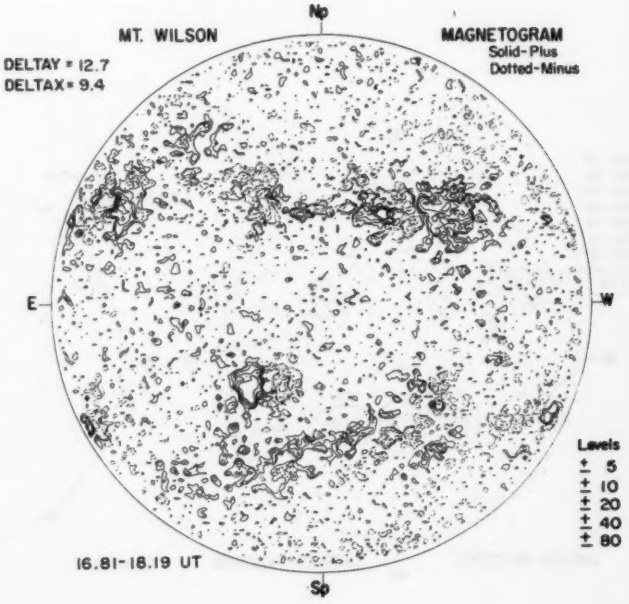
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1501 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

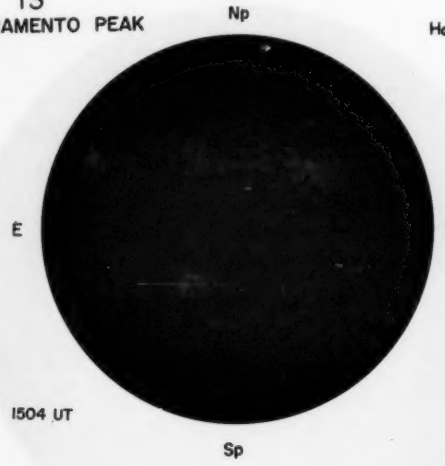
DELTAY = 12.7
DELTAX = 9.4



16.81-18.19 UT

13

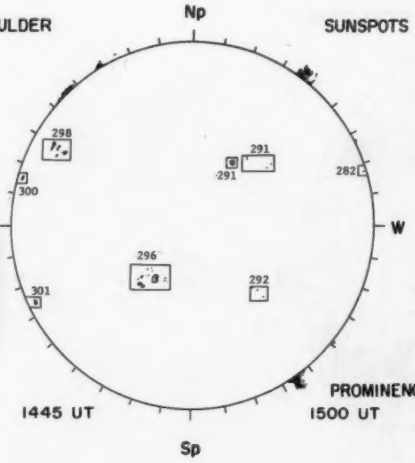
SACRAMENTO PEAK



1504 UT

Hα

BOULDER



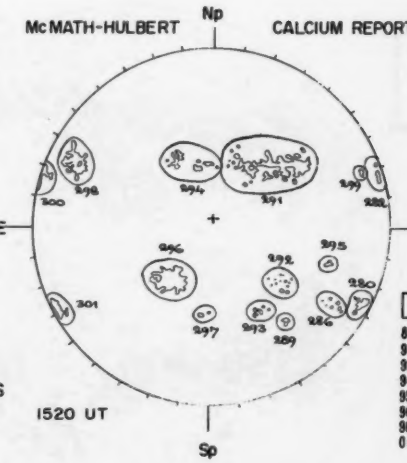
1445 UT

SUNSPOTS

PROMINENCES

1500 UT

McMATH-HULBERT



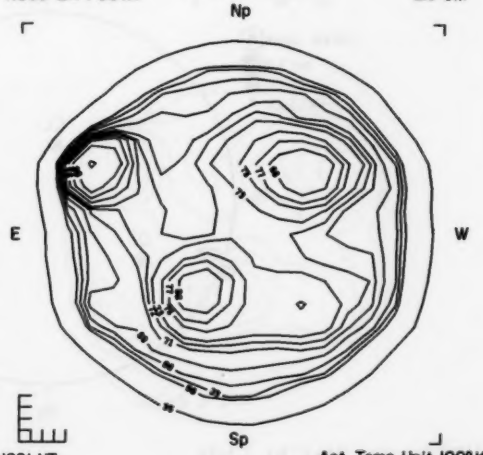
1520 UT

CALCIUM REPORT

POOR	M
80 - 2000 - 2.5	
91 - 4300 - 3.0	
92 - 0400 - 2.5	
94 - 1200 - 2.5	
95 - 0300 - 2.5	
96 - 3200 - 3.5	
98 - 4000 - 3.5	
01 - 1800 - 4.0	

NOSC LA POSTA

2.0 CM

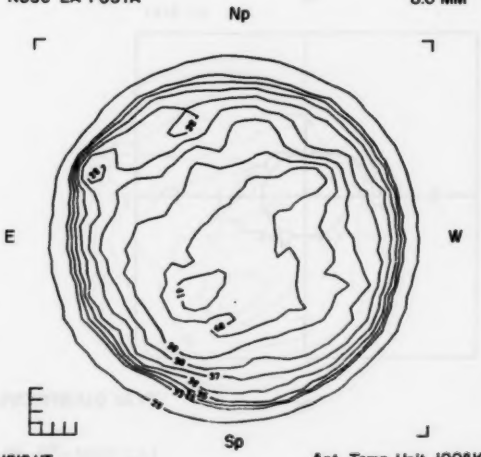


1921 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM



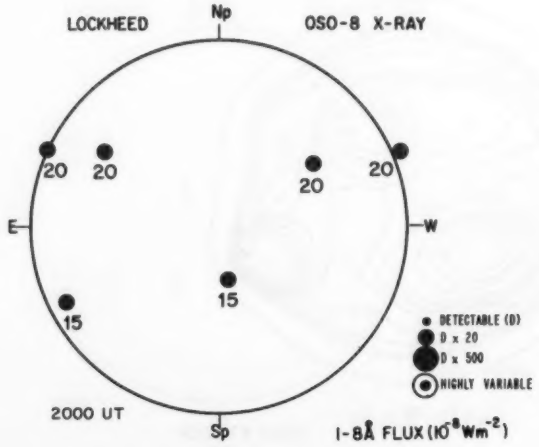
1818 UT

Ant. Temp. Unit 100°K

71
May 78

MAY 14, 1978 (P=-21.37, B_o=-2.78, L_o=266.77)

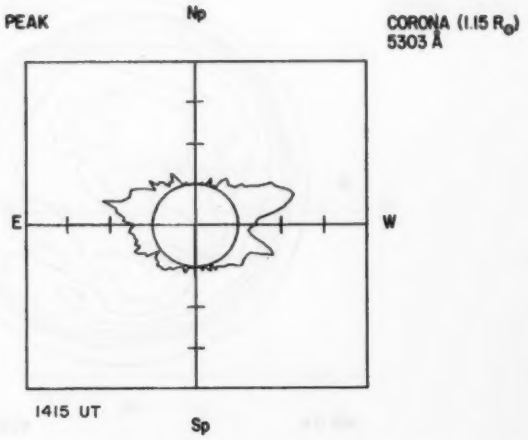
LOCKHEED OSO-8 X-RAY



2000 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

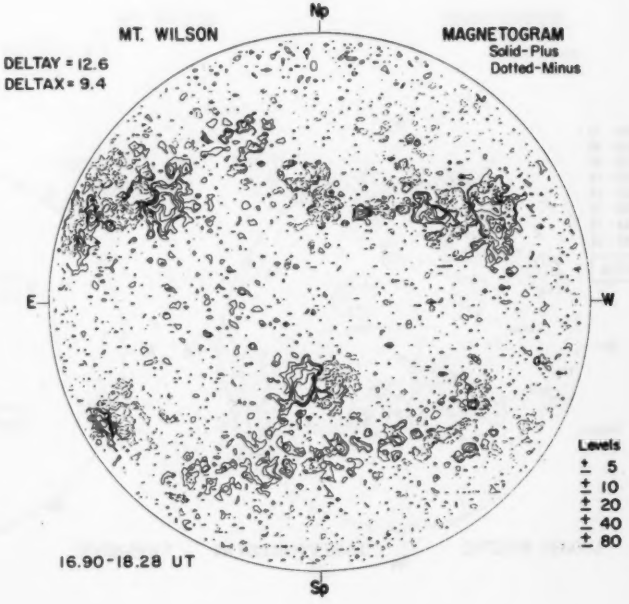


1415 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

1409 UT

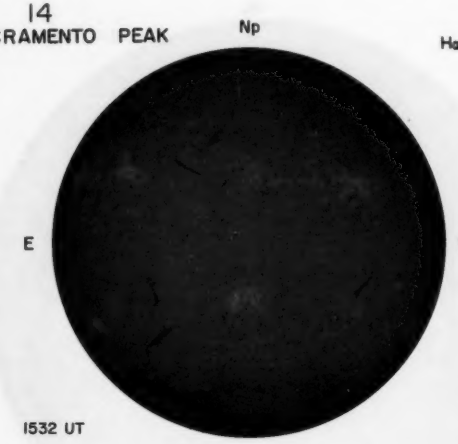
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.4



16.90-18.28 UT

14

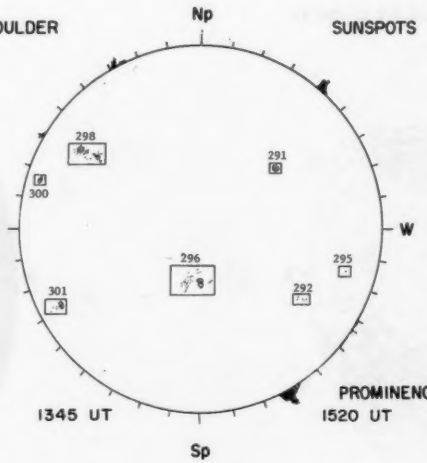
SACRAMENTO PEAK



Hα

1532 UT

BOULDER



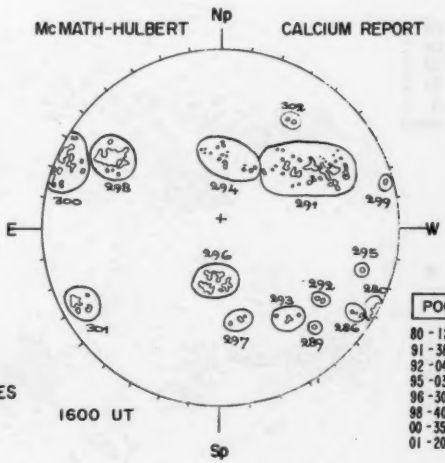
1345 UT

SUNSPOTS

PROMINENCES

1520 UT

McMATH-HULBERT



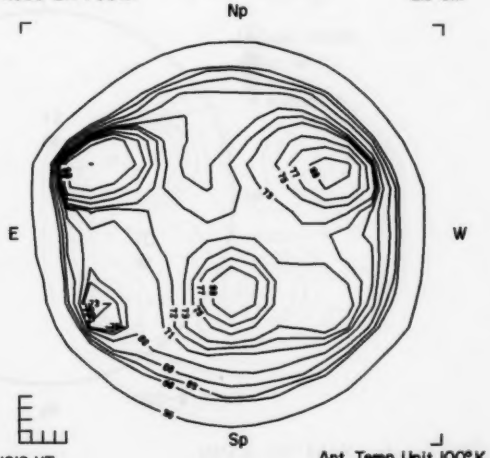
1600 UT

CALCIUM REPORT

POOR	D
80 - 1200 - 2.5	
91 - 3800 - 3.0	
92 - 0400 - 2.5	
95 - 0300 - 3.0	
96 - 3000 - 3.0	
98 - 4000 - 3.5	
00 - 3500 - 3.0	
01 - 2000 - 3.5	

NOSC LA POSTA

2.0 CM

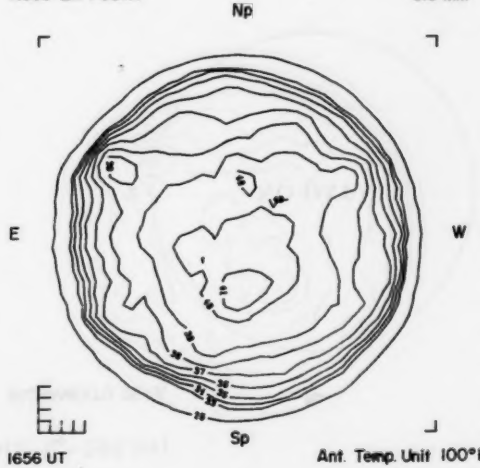


1819 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM



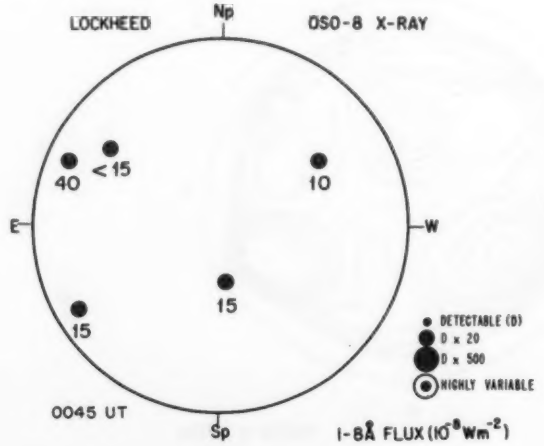
1656 UT

Ant. Temp. Unit 100°K

73
May 78

MAY 15, 1978 (P=-21.10, B_o=-2.67, L_o=253.54)

LOCKHEED OSO-8 X-RAY

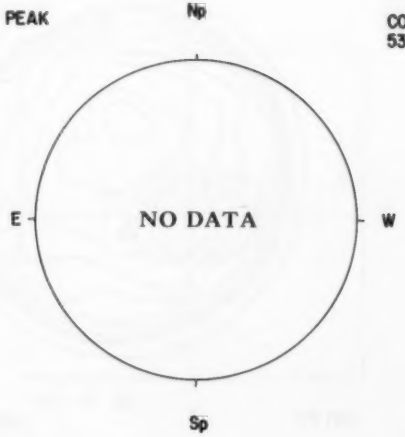


0045 UT

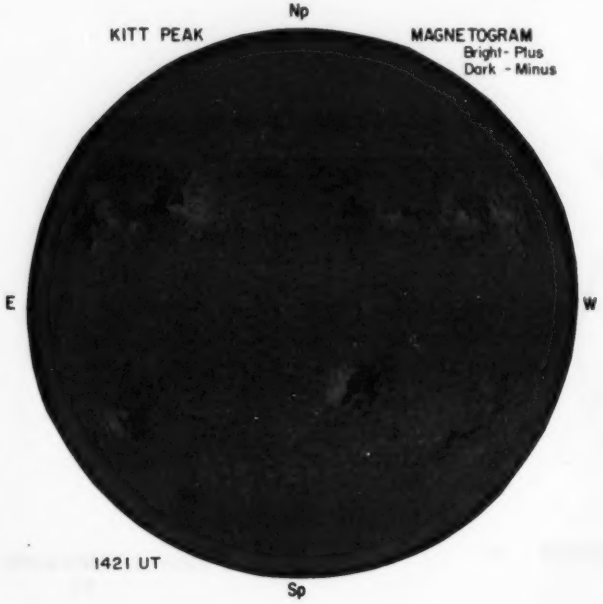
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



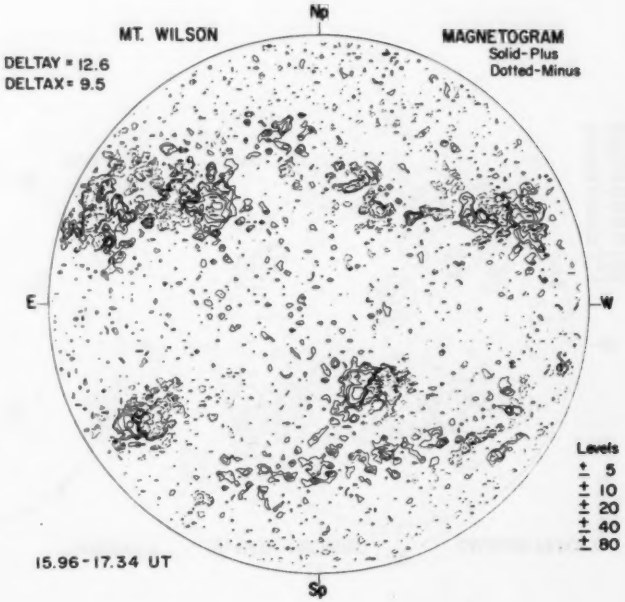
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1421 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

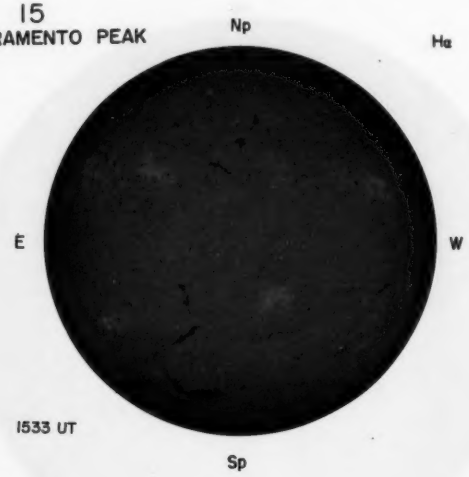
DELTAY = 12.6
DELTAX = 9.5



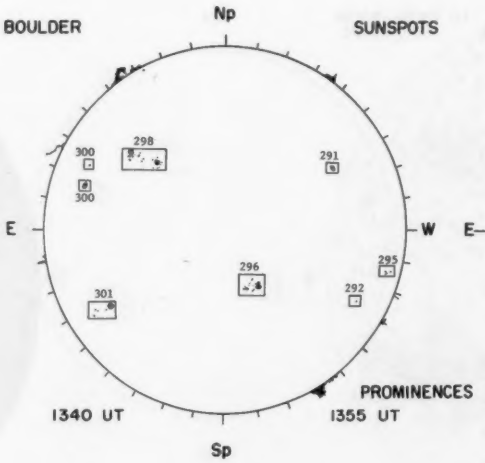
15.96 - 17.34 UT

15

SACRAMENTO PEAK

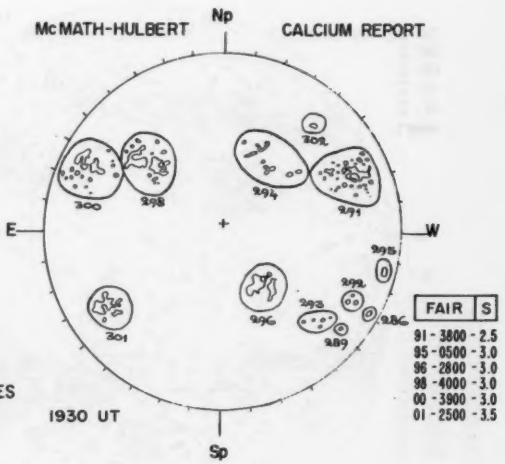


BOULDER

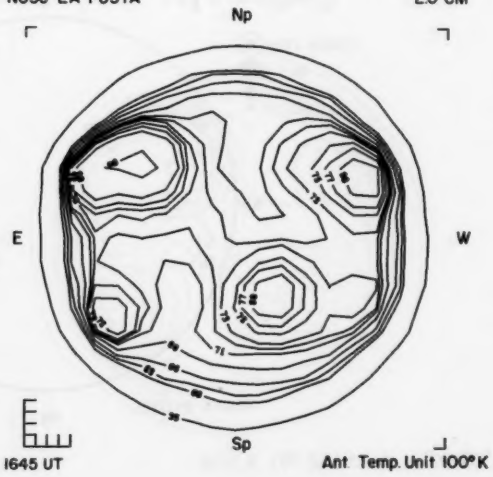


McMATH-HULBERT

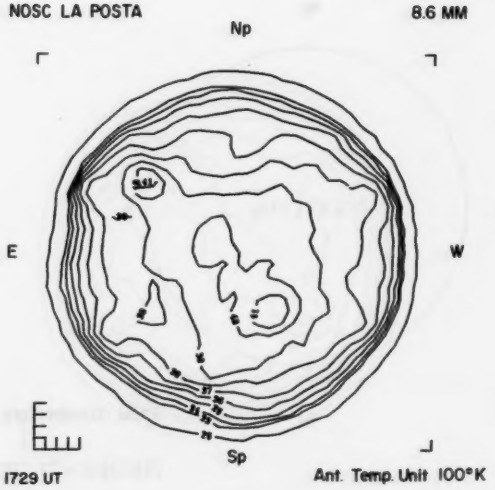
CALCIUM REPORT



NOSC LA POSTA 2.0 CM

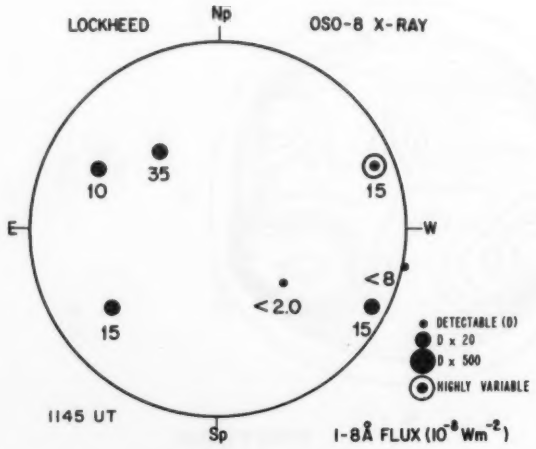


NOSC LA POSTA 8.6 MM



MAY 16, 1978 (P=-20.83, B_o=-2.55, L_o=240.32)

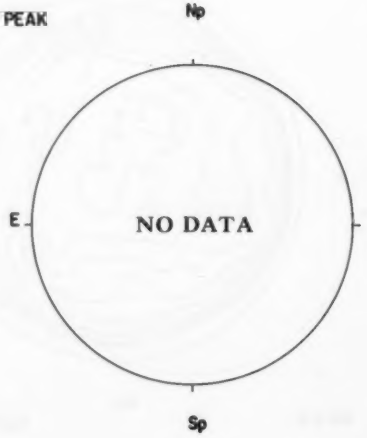
LOCKHEED OSO-8 X-RAY



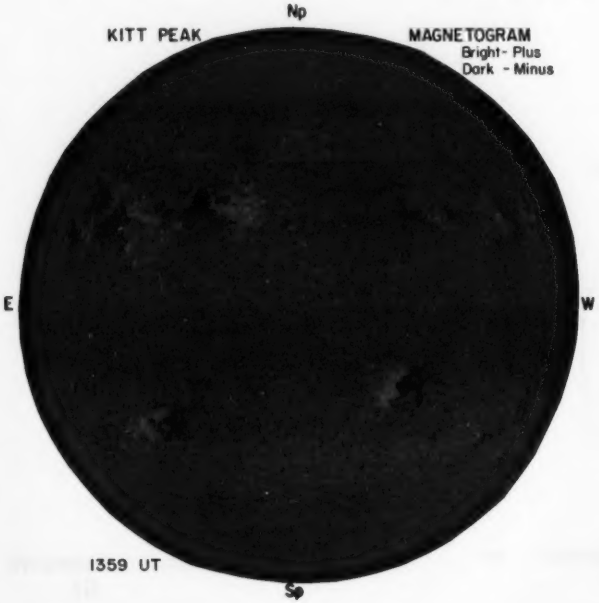
1145 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 R_o) 5303 Å



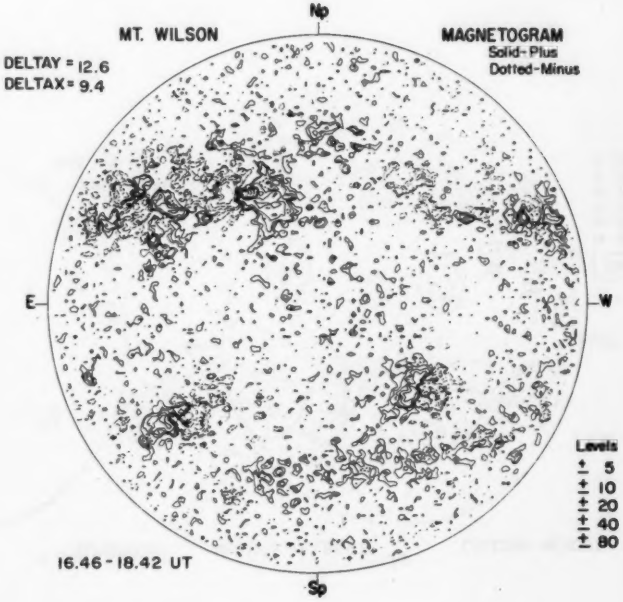
KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus



1359 UT

MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus

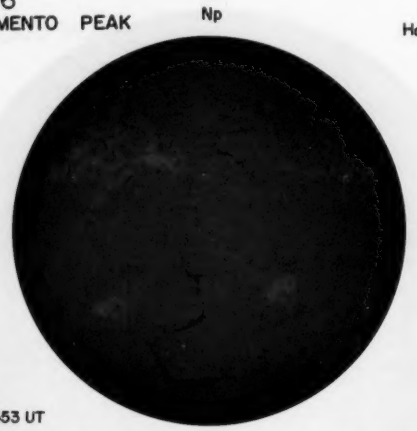
DELTAY = 12.6
DELTAX = 9.4



16.46 - 18.42 UT

16

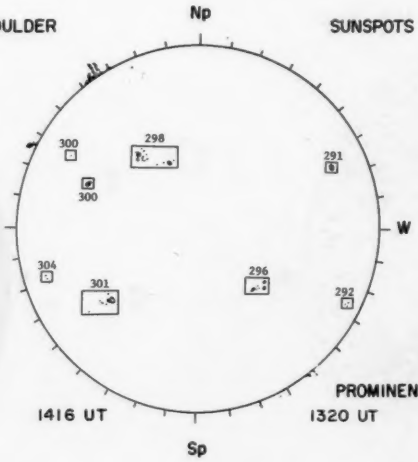
SACRAMENTO PEAK



Hα

1553 UT

BOULDER



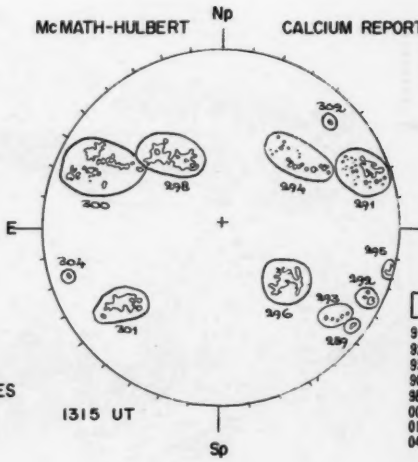
1416 UT

SUNSPOTS

PROMINENCES

1320 UT

McMATH-HULBERT



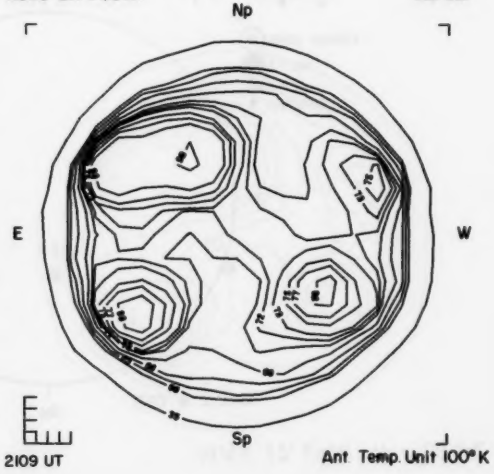
1315 UT

CALCIUM REPORT

FAIR	M
91 - 3500 - 2.5	
92 - 0700 - 3.5	
95 - 0700 - 2.5	
96 - 2800 - 3.0	
98 - 4000 - 3.5	
00 - 4500 - 3.0	
01 - 2800 - 3.5	
04 - 0300 - 2.5	

NOSC LA POSTA

2.0 CM

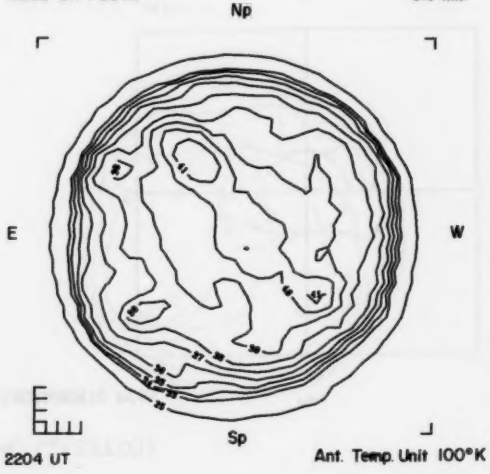


2109 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

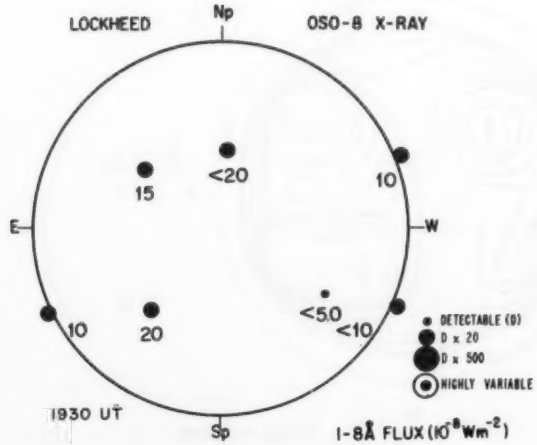


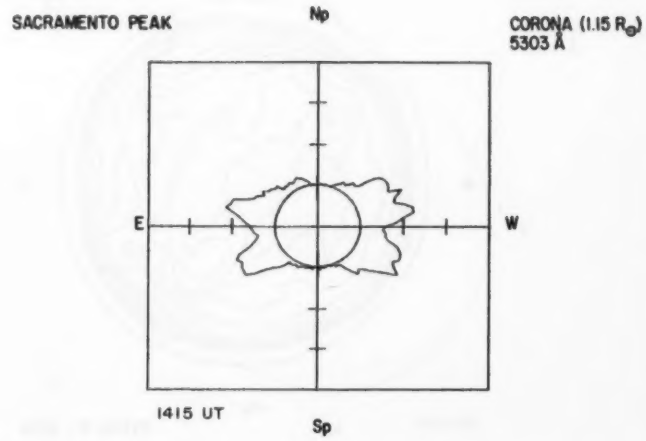
2204 UT

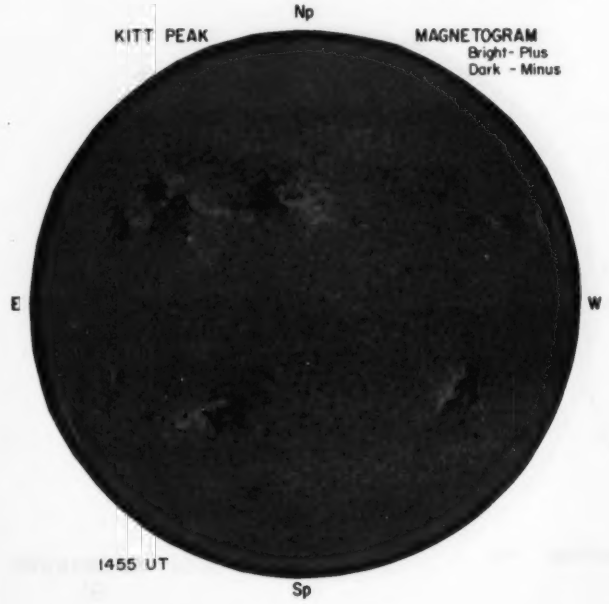
Ant. Temp. Unit 100°K

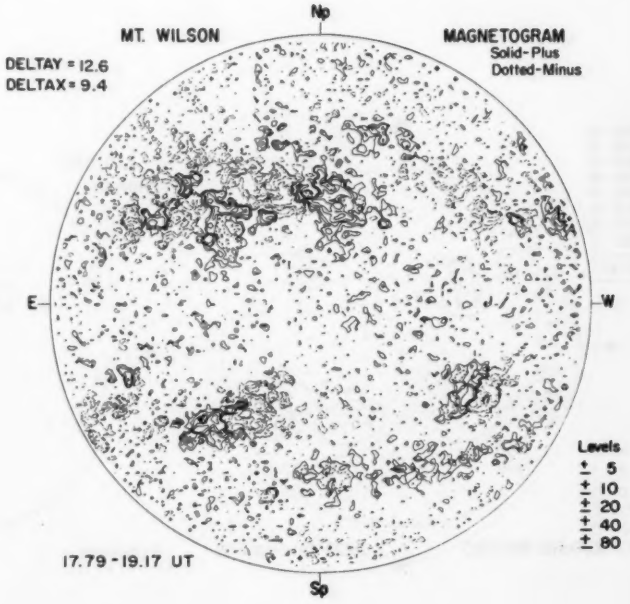
77
May 78

MAY 17, 1978 (P =-20.54, B_o =-2.44, L_o = 227.09)



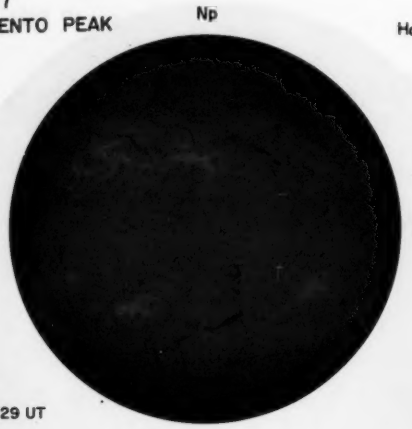






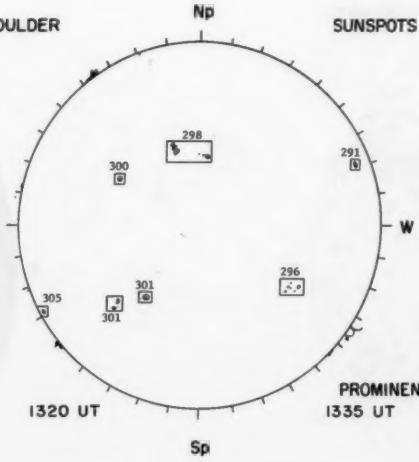
17

SACRAMENTO PEAK Hα



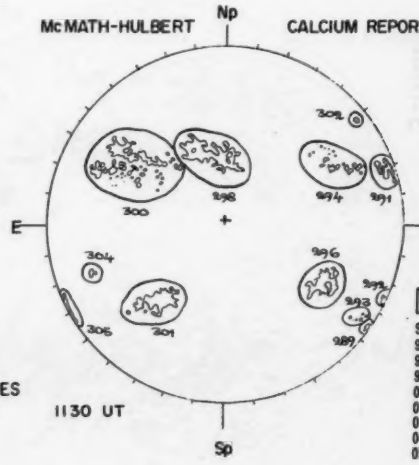
1529 UT

BOULDER SUNSPOTS



1320 UT

McMATH-HULBERT CALCIUM REPORT



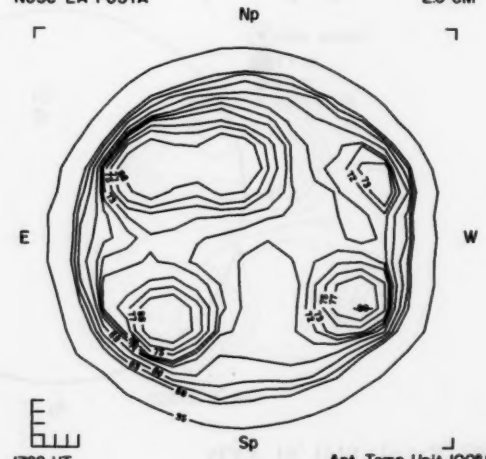
PROMINENCES

1335 UT

1130 UT

FAIR	D
91 - 3100 - 2.5	
92 - 0700 - 3.5	
96 - 3000 - 3.0	
98 - 4000 - 3.0	
00 - 5000 - 3.0	
01 - 3300 - 3.0	
02 - 0300 - 3.0	
04 - 0300 - 3.0	
05 - 1800 - 2.5	

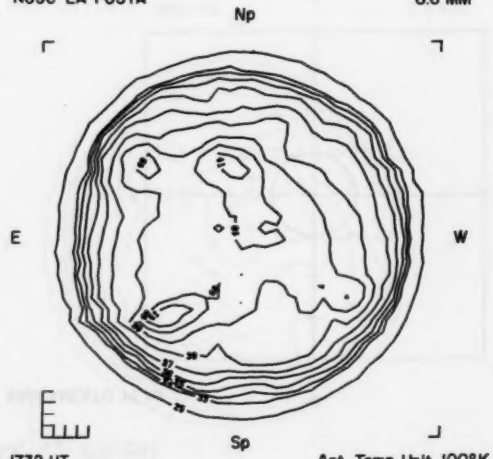
NOSC LA POSTA 2.0 CM



1702 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

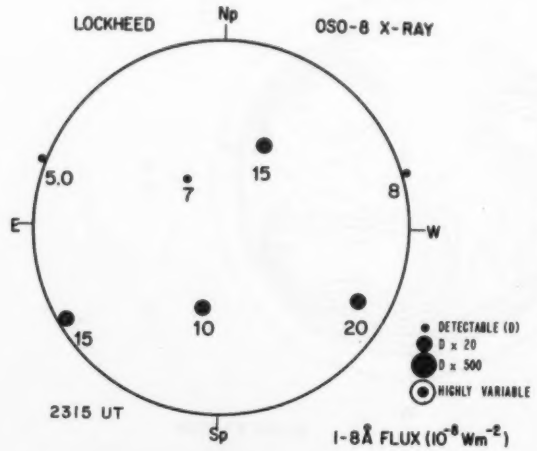


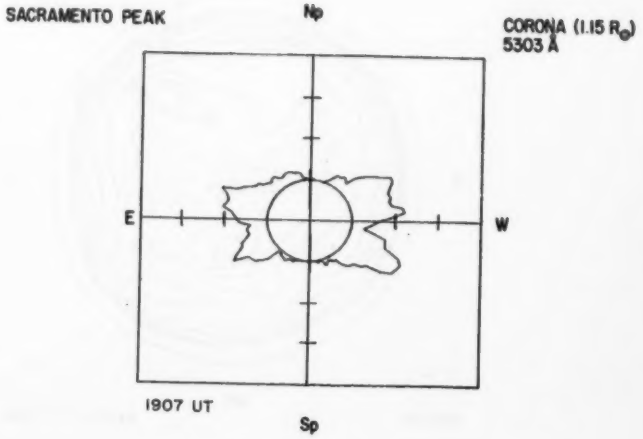
1732 UT

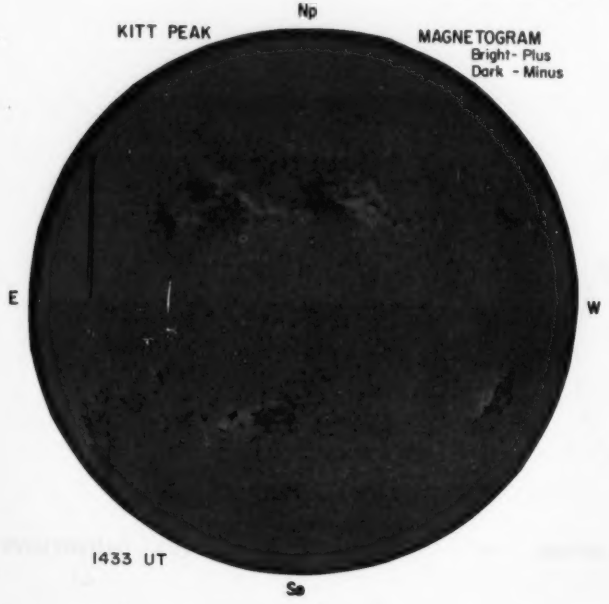
Ant. Temp. Unit 100°K

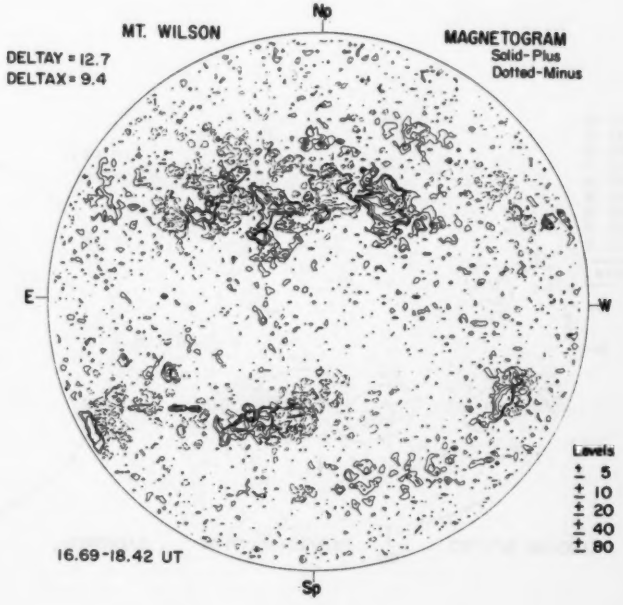
79
May 78

MAY 18, 1978 (P =-20.26, B_o =-2.33, L_o = 213.86)



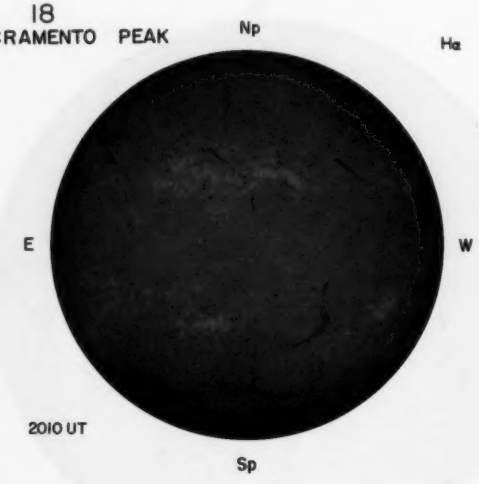






18

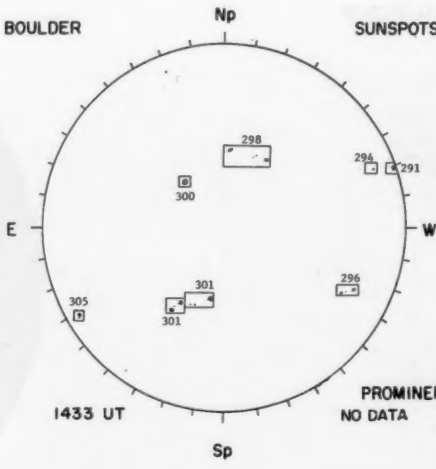
SACRAMENTO PEAK



2010 UT

Hα

BOULDER



1433 UT

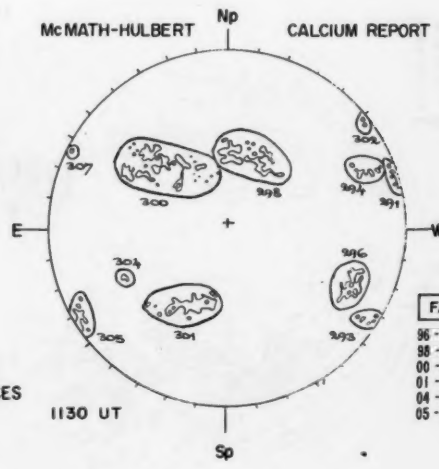
SUNSPOTS

PROMINENCES

NO DATA

McMATH-HULBERT

CALCIUM REPORT

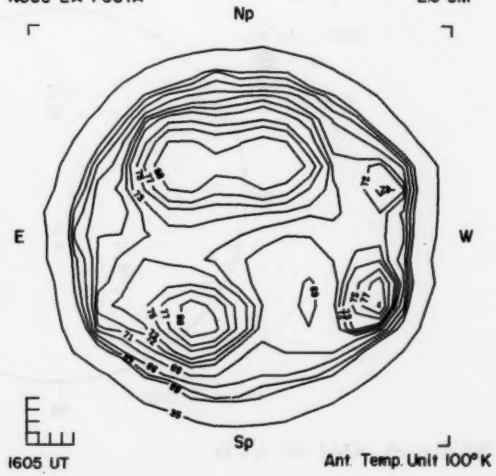


1130 UT

FAIR	S
96 - 2900 - 3.0	
98 - 3600 - 3.0	
00 - 5300 - 3.0	
01 - 3300 - 3.5	
04 - 0300 - 3.0	
05 - 2000 - 2.5	

NOSC LA POSTA

2.0 CM

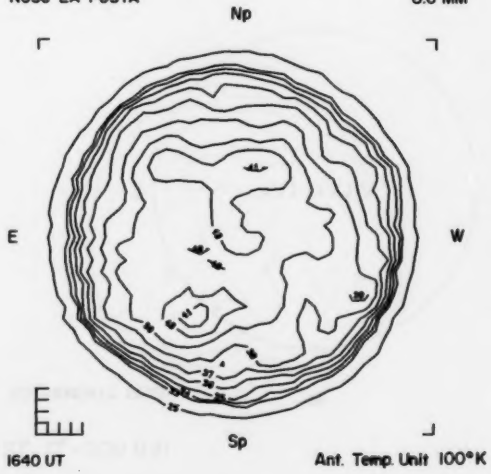


1605 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

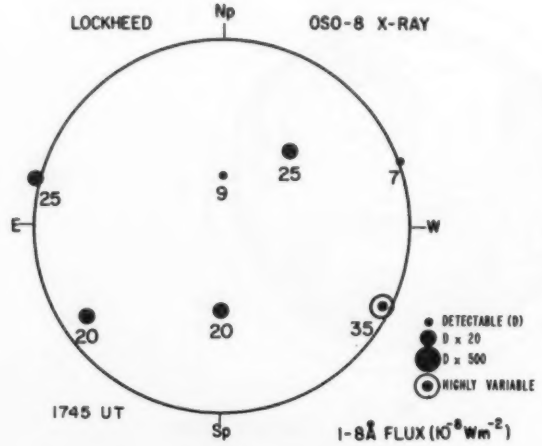


1640 UT

Ant. Temp. Unit 100°K

MAY 19, 1978 (P =-19.96, B_o =-2.21, L_o =200.63)

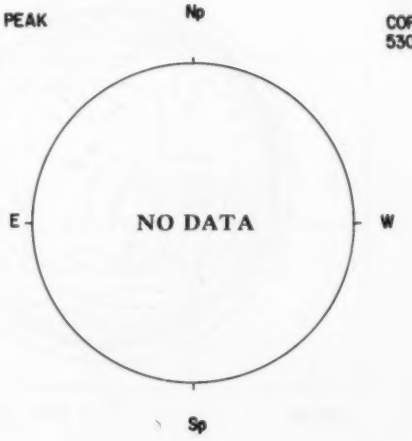
LOCKHEED OSO-8 X-RAY



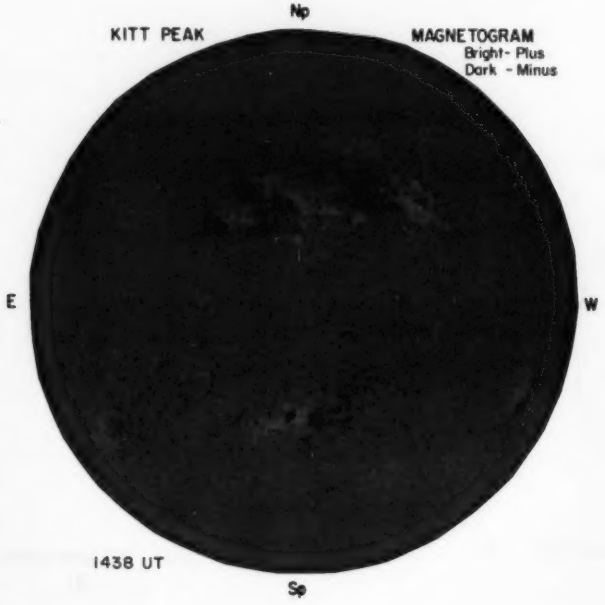
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

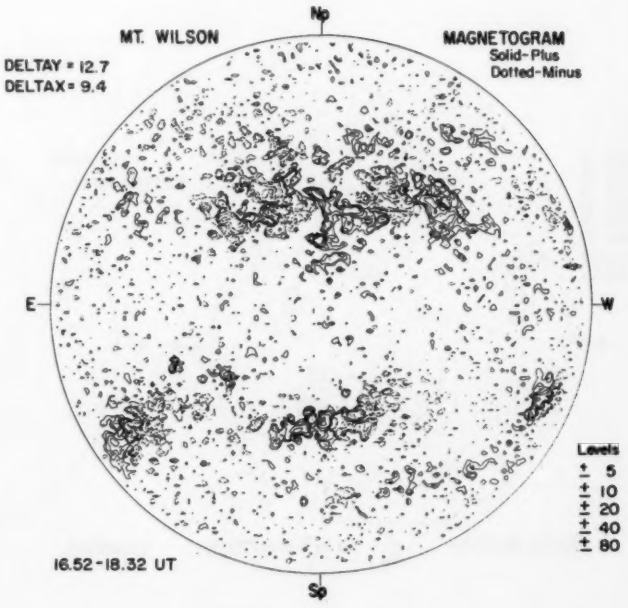


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



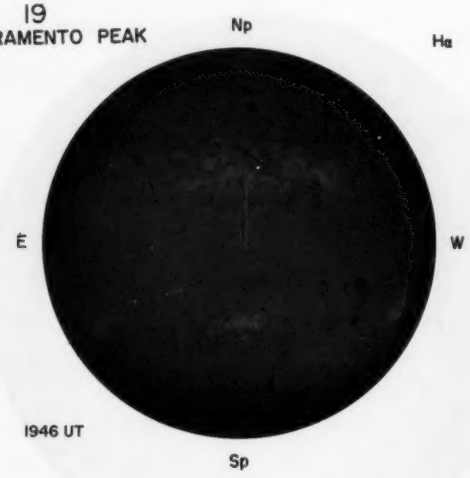
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.7
DELTAX = 9.4



19

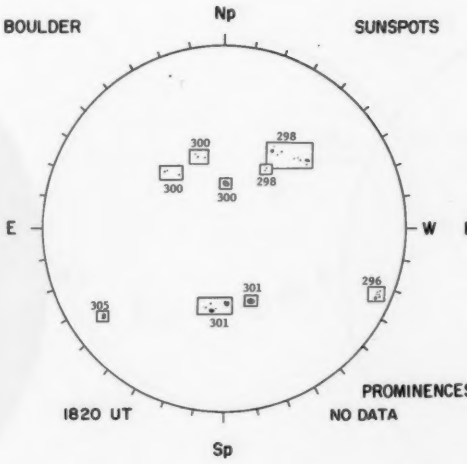
SACRAMENTO PEAK



1946 UT

Hα

BOULDER



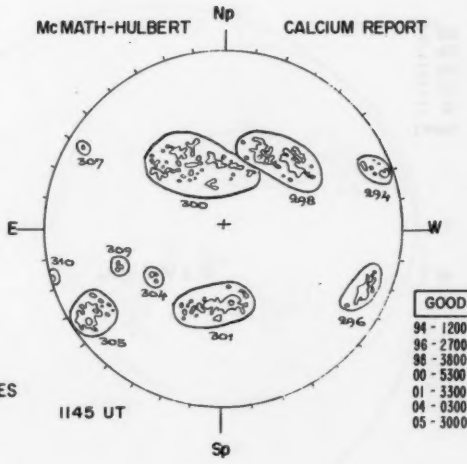
1820 UT

SUNSPOTS

PROMINENCES

NO DATA

McMATH-HULBERT



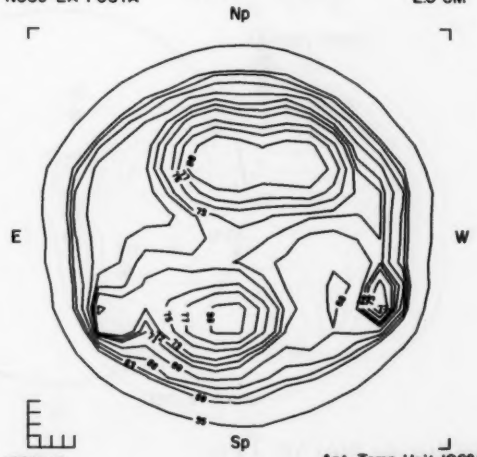
1145 UT

CALCIUM REPORT

GOOD	S
94 - 1200 - 2.5	
96 - 2700 - 3.5	
98 - 3800 - 3.0	
00 - 5300 - 3.0	
01 - 3300 - 3.0	
04 - 0300 - 2.5	
05 - 3000 - 3.0	

NOSC LA POSTA

2.0 CM

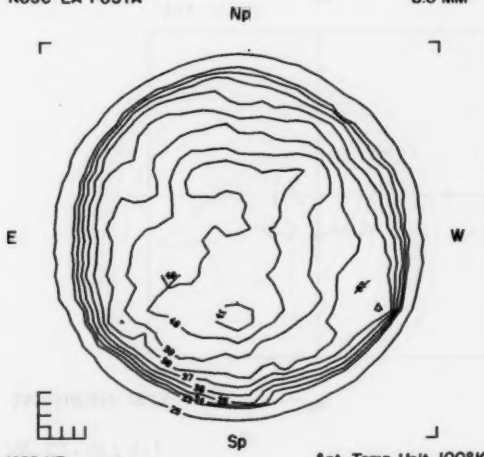


1550 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

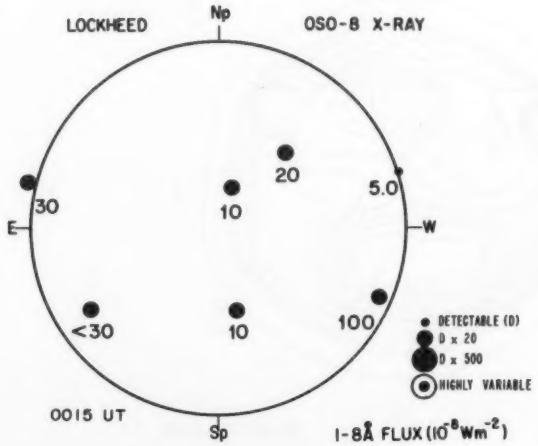


1625 UT

Ant. Temp. Unit 100°K

MAY 20, 1978 (P =-19.66, B_o =-2.09, L_o = 187.41)

LOCKHEED OSO-8 X-RAY

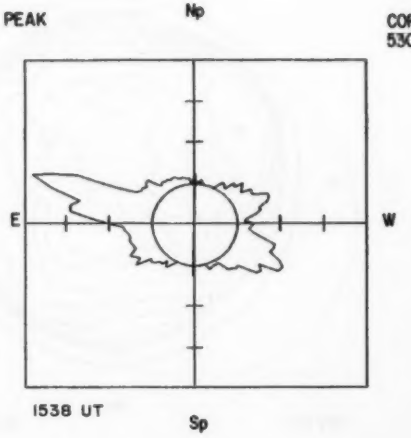


0015 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

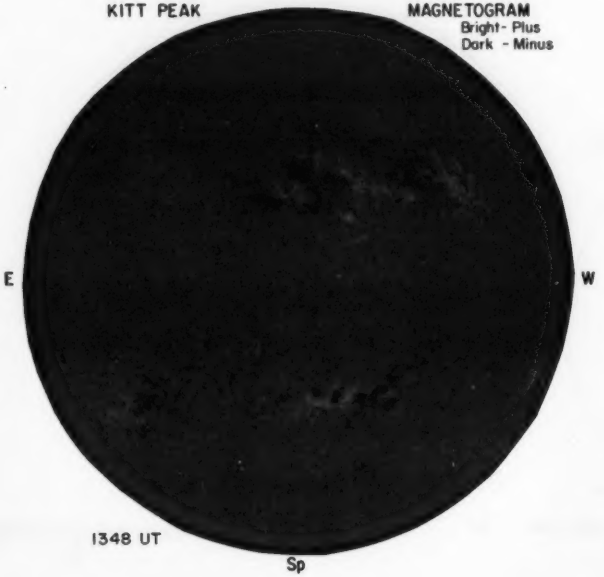
CORONA (1.15 $R_\odot$)
5303 Å



1538 UT

KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

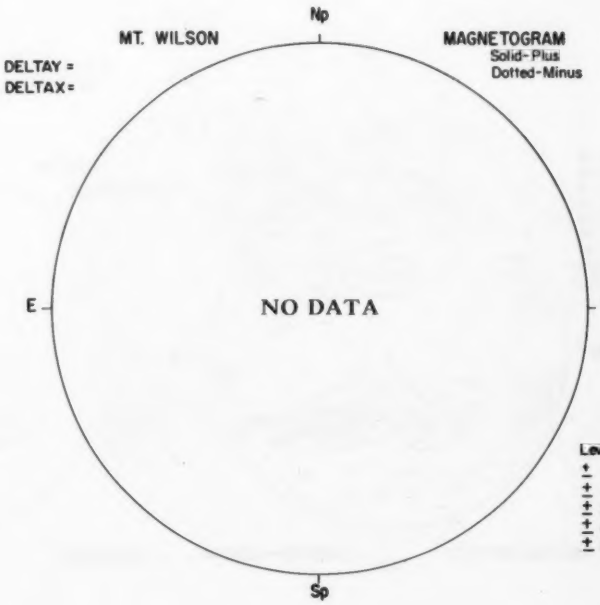


1348 UT

MT. WILSON

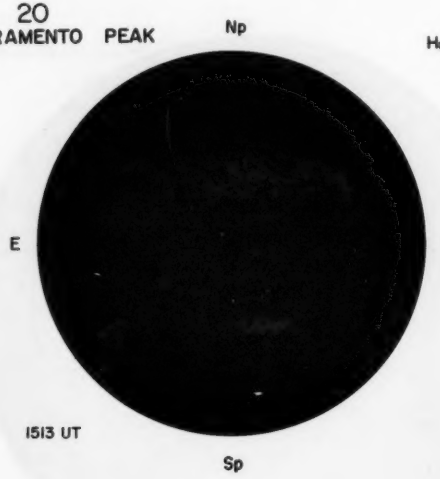
DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

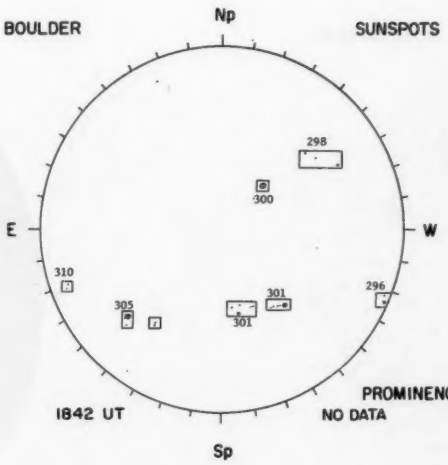


20

SACRAMENTO PEAK



Hα BOULDER



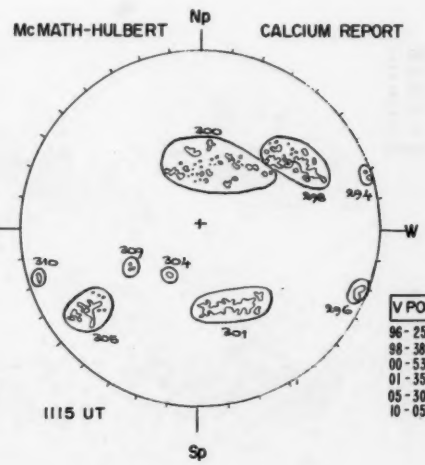
SUNSPOTS

PROMINENCES

NO DATA

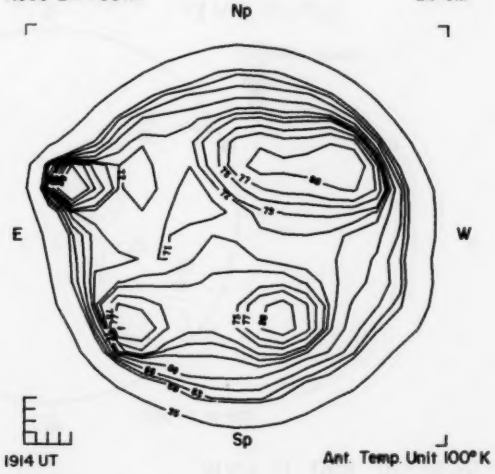
McMATH-HULBERT

CALCIUM REPORT

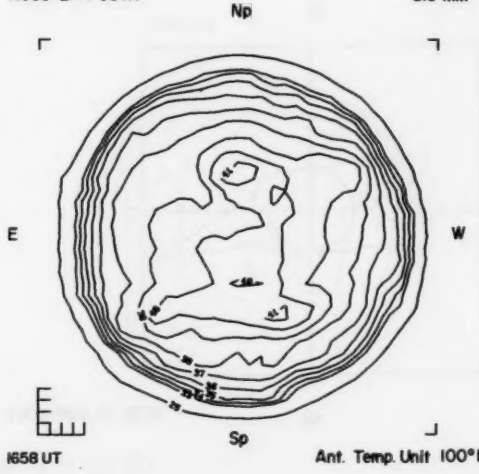


V POOR	M
96 - 2500	- 3.5
98 - 3800	- 3.0
00 - 5300	- 3.0
01 - 3500	- 3.0
05 - 3000	- 3.0
10 - 0500	- 2.5

NOSC LA POSTA 2.0 CM

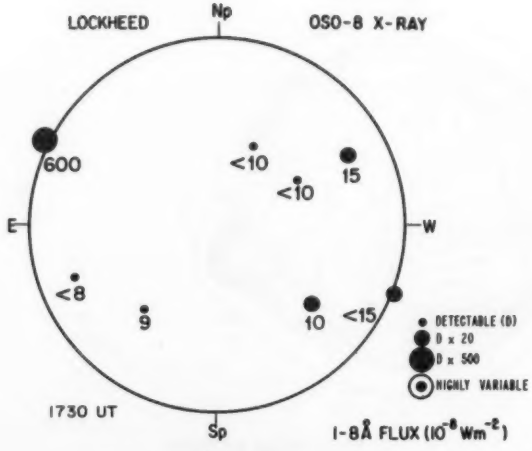


NOSC LA POSTA 8.6 MM



MAY 21, 1978 (P=-19.35, B_o=-1.98, L_o=174.18)

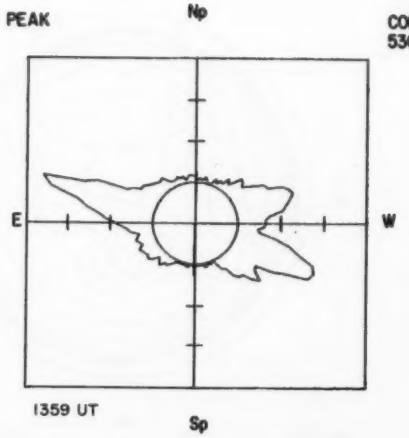
LOCKHEED OSO-8 X-RAY



1730 UT

1-8Å FLUX (10^{-8} Wm^{-2})

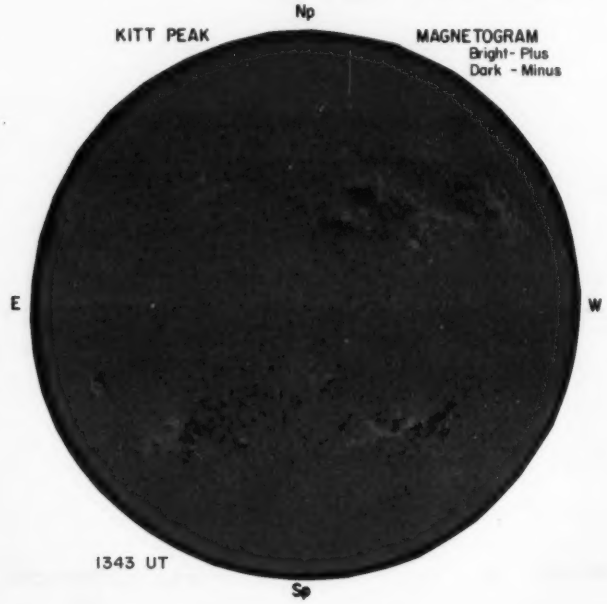
SACRAMENTO PEAK



1359 UT

KITT PEAK MAGNETOGRAM

Bright - Plus
Dark - Minus

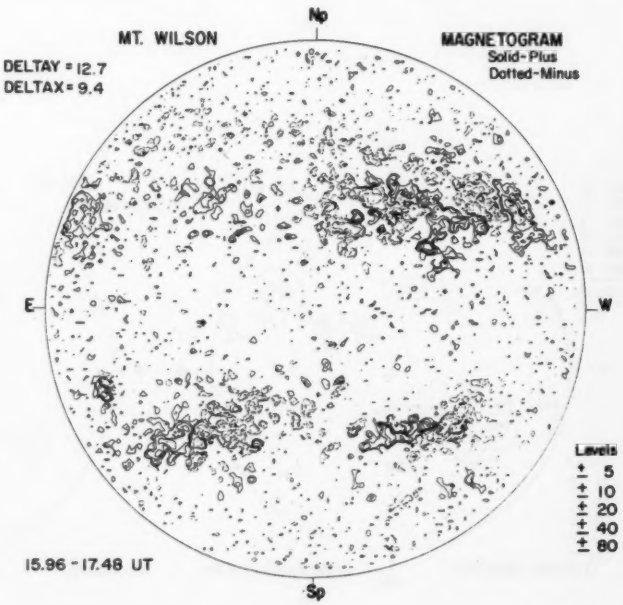


1343 UT

MT. WILSON MAGNETOGRAM

Solid - Plus
Dotted - Minus

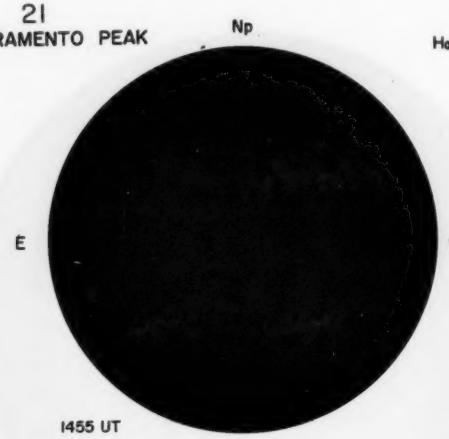
DELTAY = 12.7
DELTAX = 9.4



15.96 - 17.48 UT

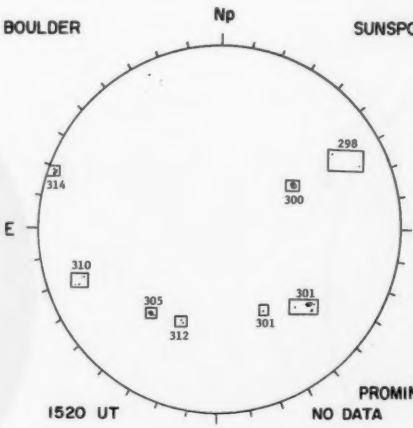
21

SACRAMENTO PEAK Hα



1455 UT

BOULDER SUNSPOTS

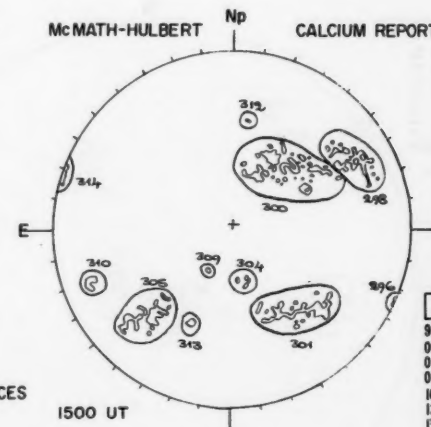


1520 UT

PROMINENCES

NO DATA

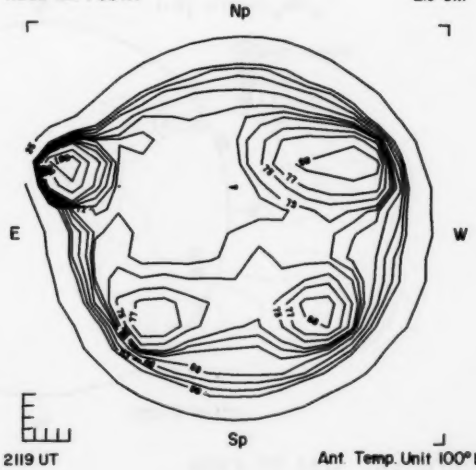
McMATH-HULBERT CALCIUM REPORT



1500 UT

FAIR	S
98 - 4000 - 3.0	
00 - 5300 - 3.5	
01 - 3500 - 3.5	
05 - 3000 - 3.0	
10 - 0700 - 3.0	
12 - 0100 - 2.5	
13 - 0300 - 3.0	
14 - 1500 - 3.5	

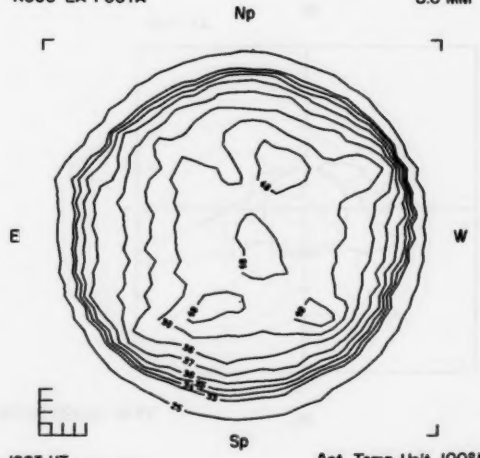
NOSC LA POSTA 2.0 CM



2119 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

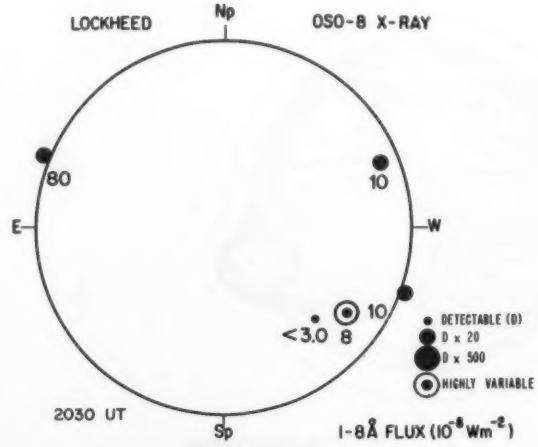


1903 UT

Ant. Temp. Unit 100°K

MAY 22, 1978 (P=-19.04, B_o=-1.86, L_o=160.95)

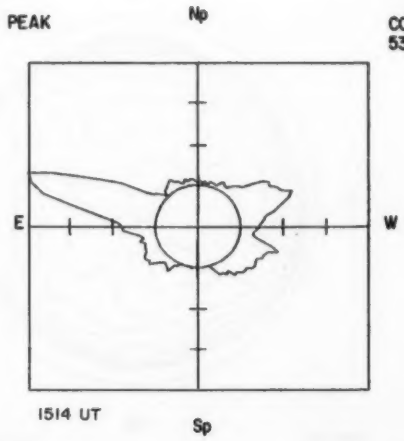
LOCKHEED OSO-8 X-RAY



2030 UT

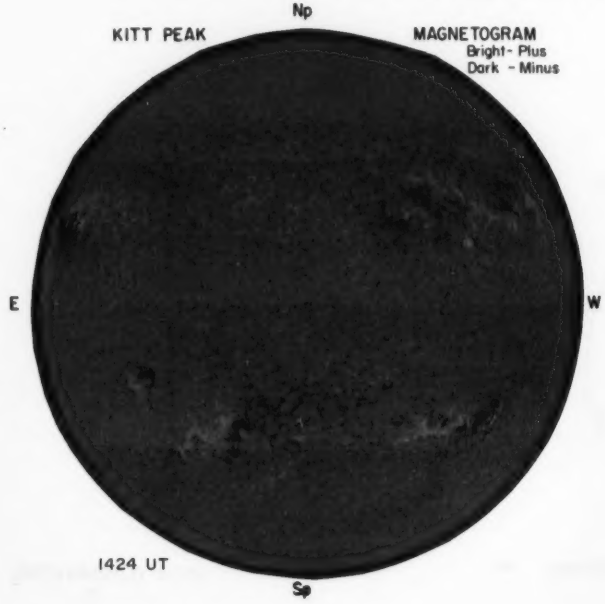
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



1514 UT

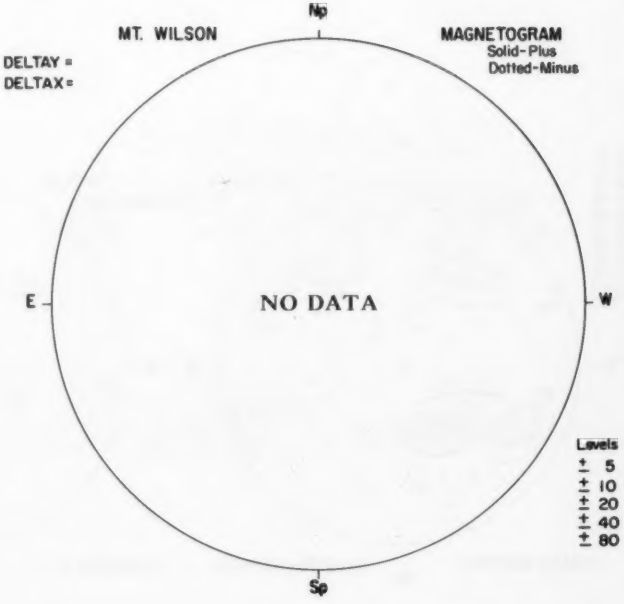
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1424 UT

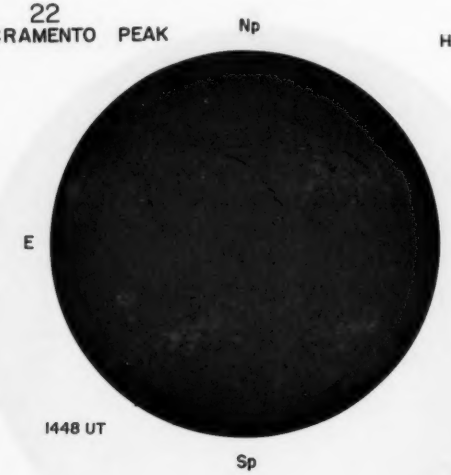
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

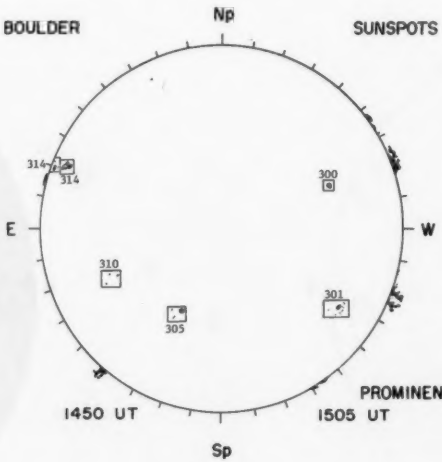


22

SACRAMENTO PEAK



Hα BOULDER



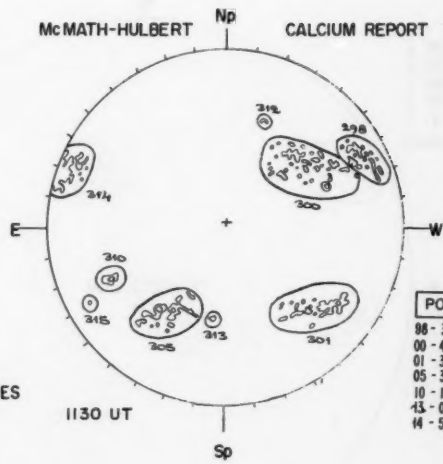
SUNSPOTS

PROMINENCES

1505 UT

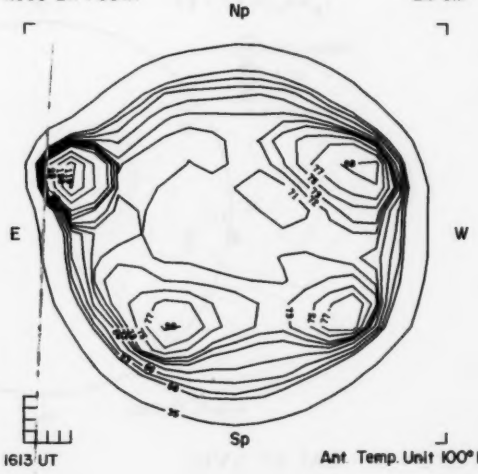
McMATH-HULBERT

CALCIUM REPORT

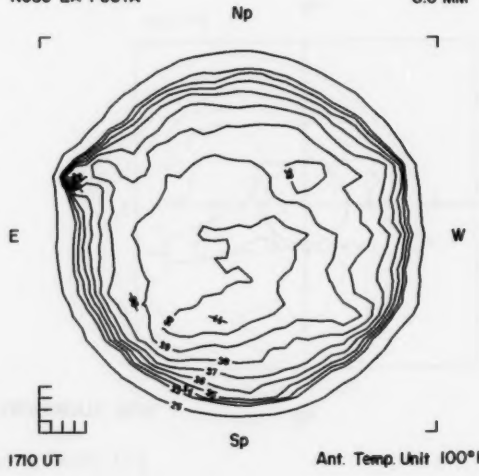


POOR	D
98 - 3800	- 3.0
00 - 4900	- 3.0
01 - 3200	- 3.5
05 - 3000	- 3.0
10 - 1000	- 3.0
13 - 0200	- 3.0
14 - 5100	- 3.5

NOSC LA POSTA 2.0 CM

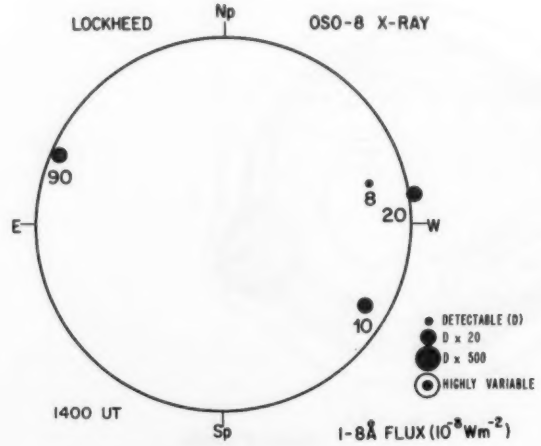


NOSC LA POSTA 8.6 MM



MAY 23, 1978 (P =-18.72, B_0 =-1.74, L_0 =147.72)

LOCKHEED OSO-8 X-RAY

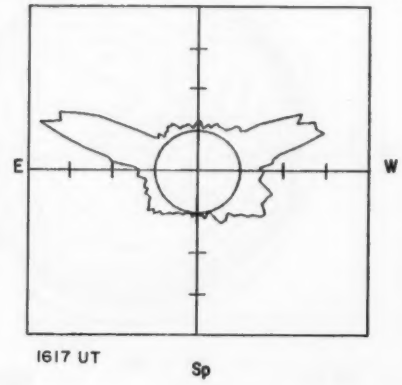


1400 UT

1-8Å FLUX (10^{-8} Wm^{-2})

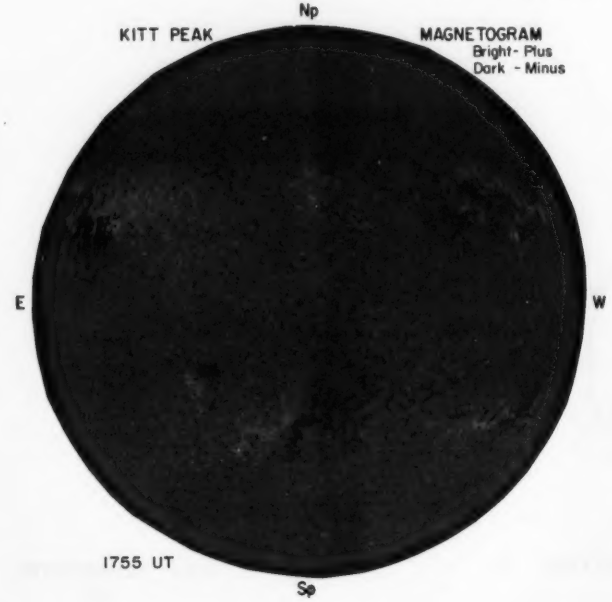
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



1617 UT

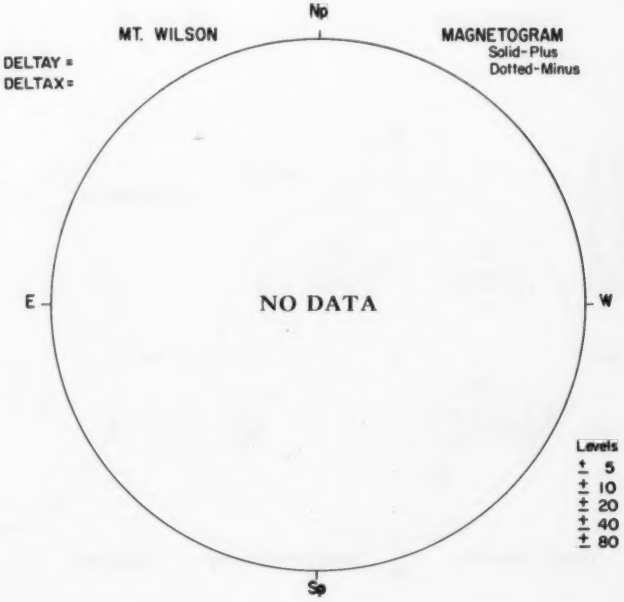
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



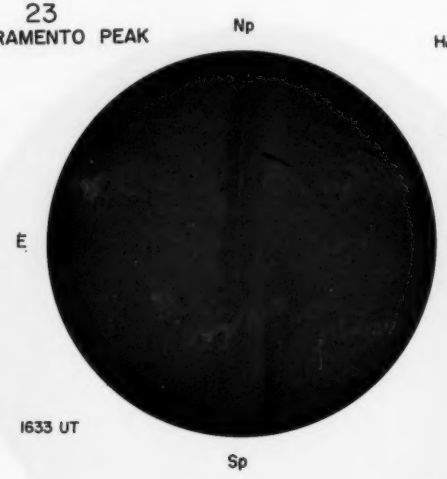
1755 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

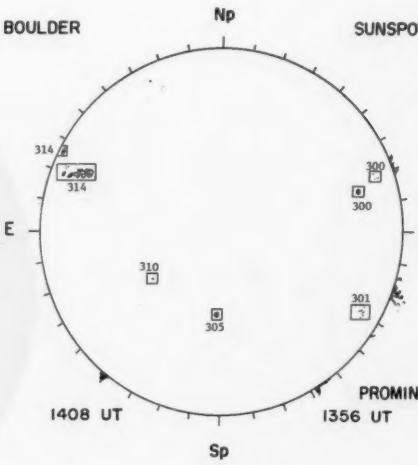


23
SACRAMENTO PEAK



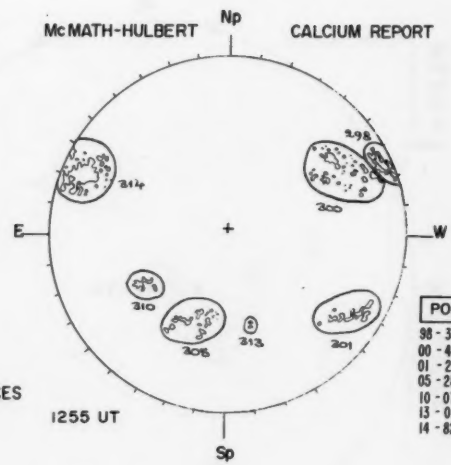
1633 UT

Hα BOULDER



1408 UT

SUNSPOTS



1356 UT

McMATH-HULBERT

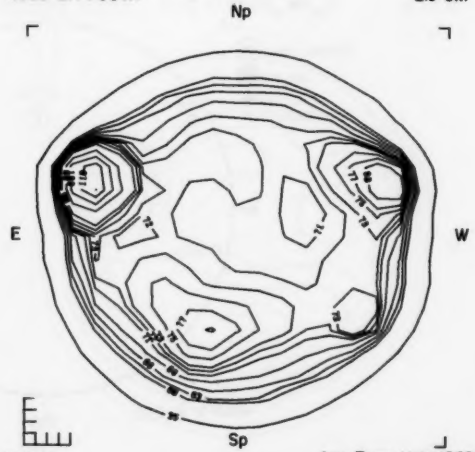
1255 UT

CALCIUM REPORT

POOR	S
98 - 3000 - 2.5	
00 - 4200 - 3.0	
01 - 2500 - 3.0	
05 - 2800 - 2.5	
10 - 0700 - 2.5	
13 - 0100 - 2.5	
14 - 8200 - 3.5	

PROMINENCES

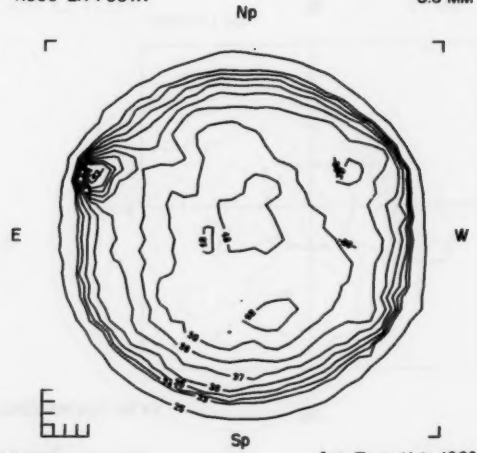
NOSC LA POSTA 2.0 CM



1638 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

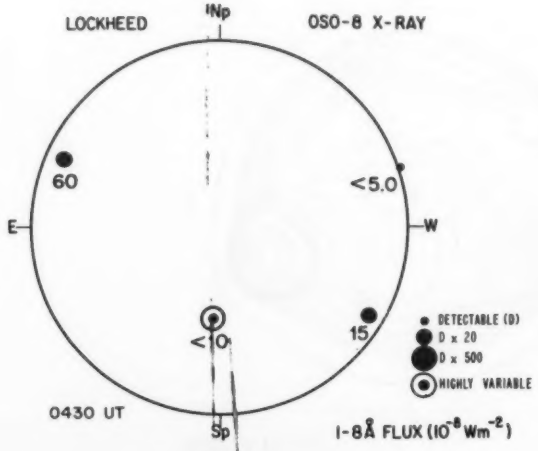


2035 UT

Ant. Temp. Unit 100°K

MAY 24, 1978 (P =-18.40, B_o =-1.62, L_o =134.49)

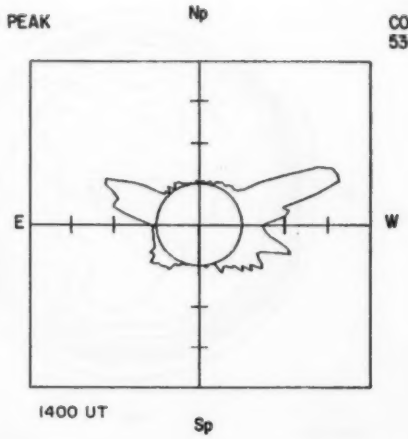
LOCKHEED OSO-8 X-RAY



0430 UT

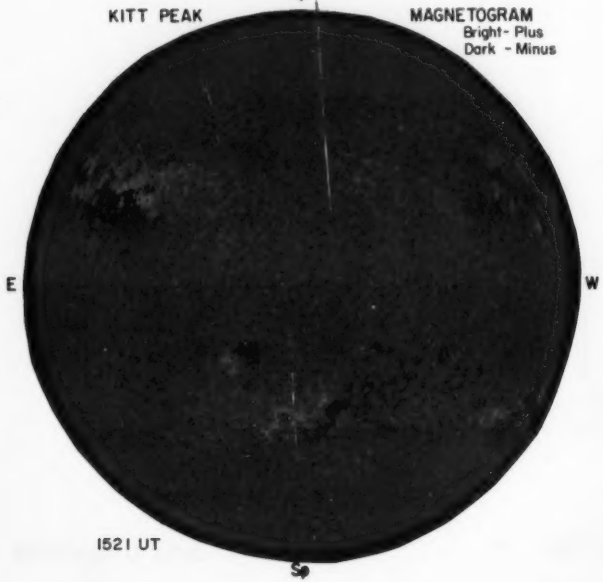
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK



1400 UT

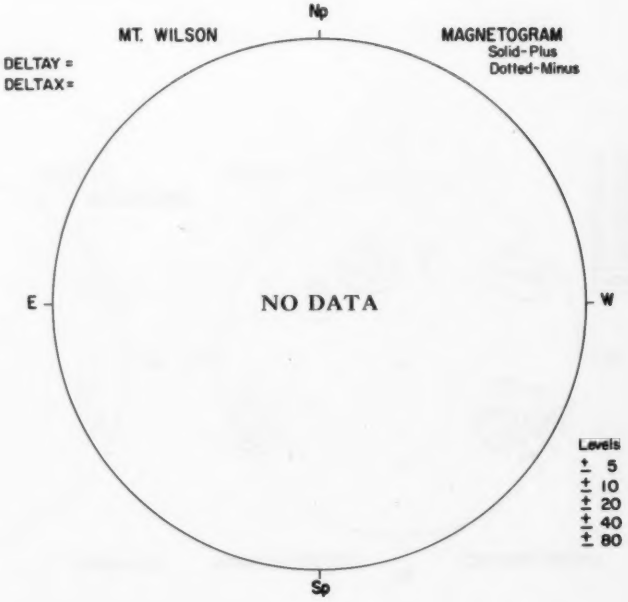
KITT PEAK MAGNETOGRAM
Bright- Plus
Dark - Minus



1521 UT

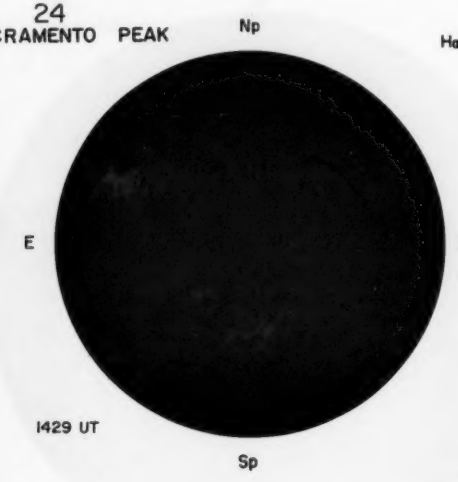
MT. WILSON MAGNETOGRAM
Solid-Plus
Dotted-Minus

DELTAY =
DELTAX=

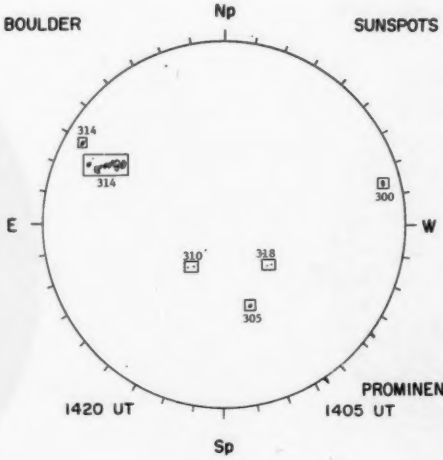


24

SACRAMENTO PEAK



Hα BOULDER



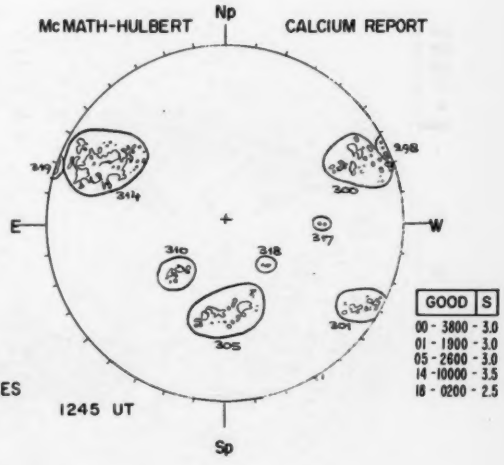
SUNSPOTS

PROMINENCES

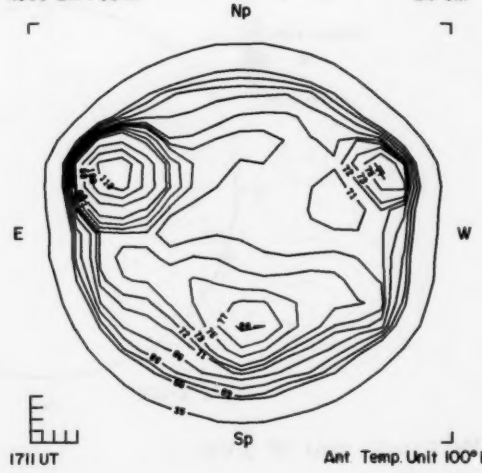
1405 UT

McMATH-HULBERT

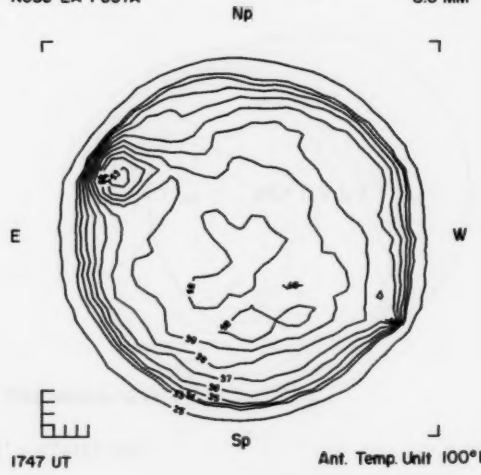
CALCIUM REPORT



NOSC LA POSTA 2.0 CM

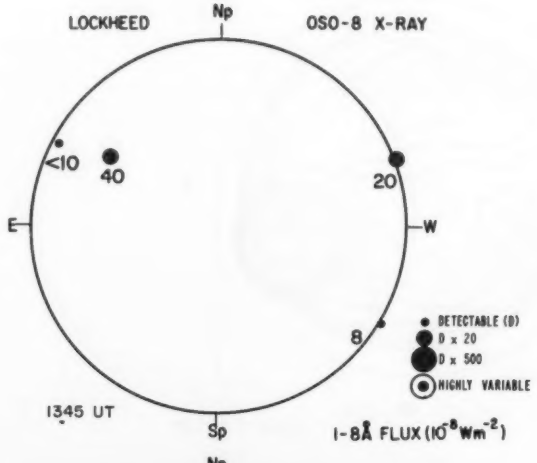


NOSC LA POSTA 8.6 MM

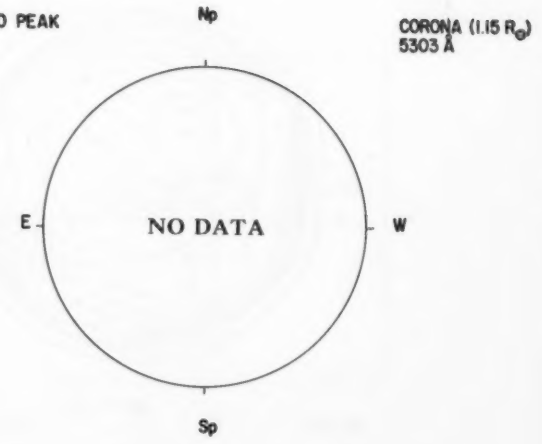


MAY 25, 1978 (P =-18.06, B_o =-1.51, L_o =121.26)

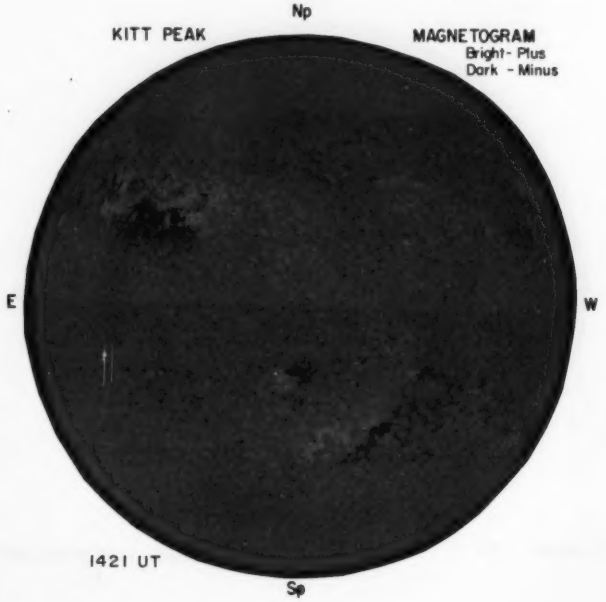
LOCKHEED OSO-8 X-RAY



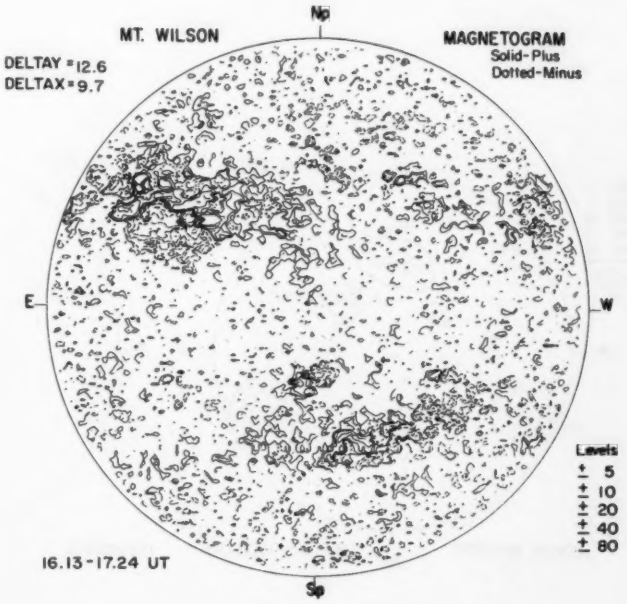
SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

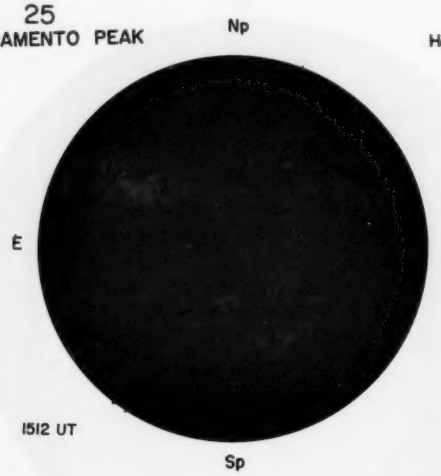


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus



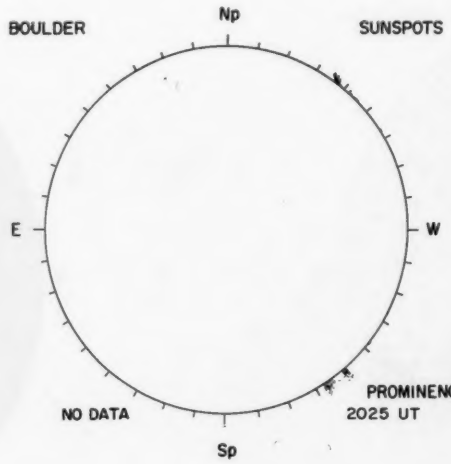
25

SACRAMENTO PEAK



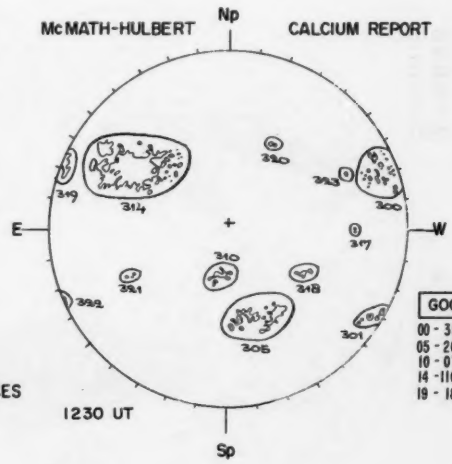
1512 UT

Hα BOULDER



NO DATA

SUNSPOTS



PROMINENCES

2025 UT

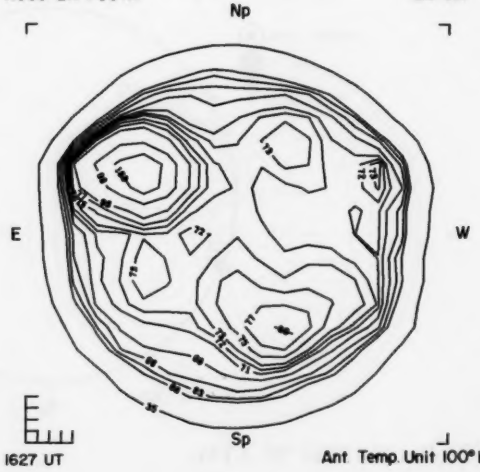
McMATH-HULBERT

1230 UT

CALCIUM REPORT

GOOD	S
00 - 3500	- 2.0
05 - 2600	- 2.5
10 - 0700	- 2.5
14 - 11000	- 3.5
19 - 1800	- 3.0

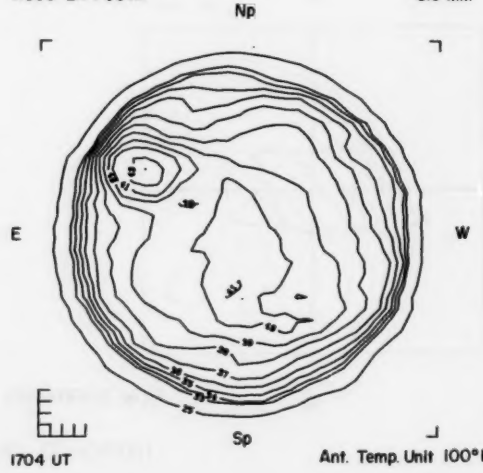
NOSC LA POSTA 2.0 CM



1627 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



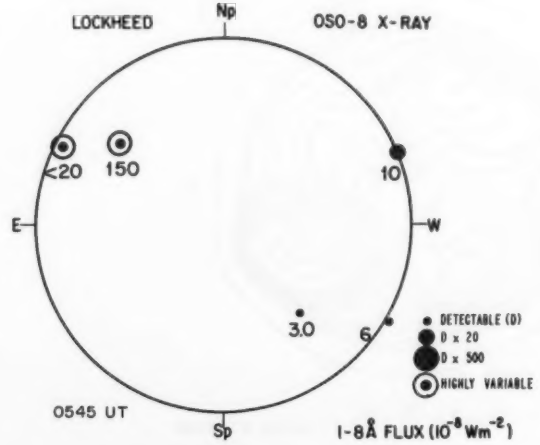
1704 UT

Ant. Temp. Unit 100°K

95
May 78

MAY 26, 1978 (P =-17.73, B_0 =-1.39, L_0 =108.02)

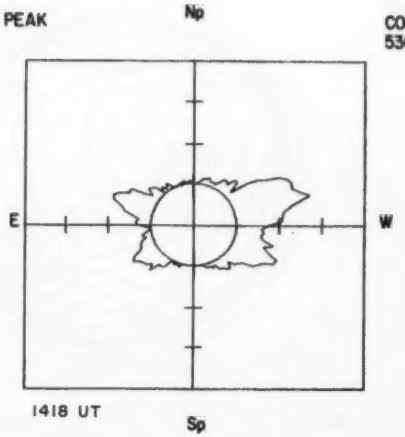
LOCKHEED OSO-8 X-RAY



0545 UT

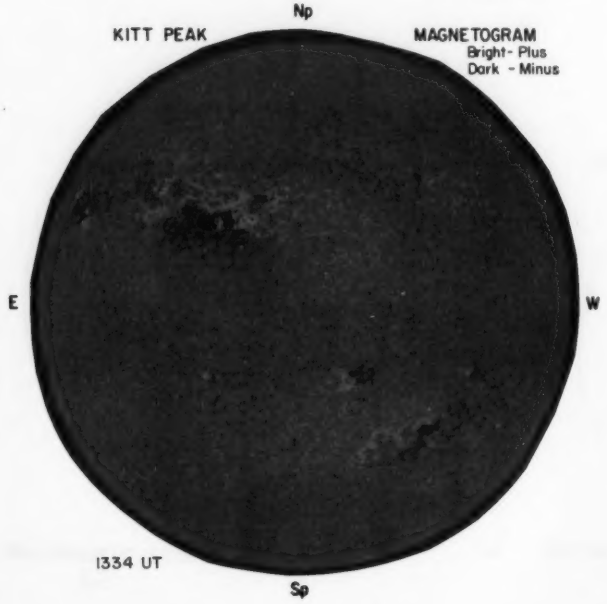
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK



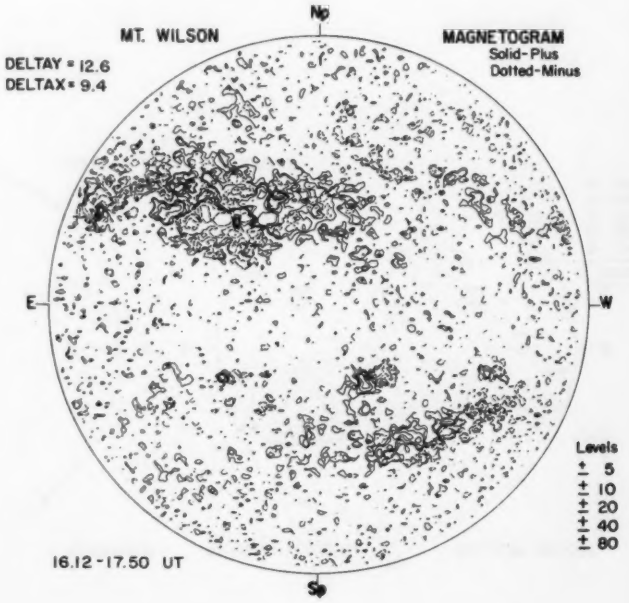
1418 UT

KITT PEAK



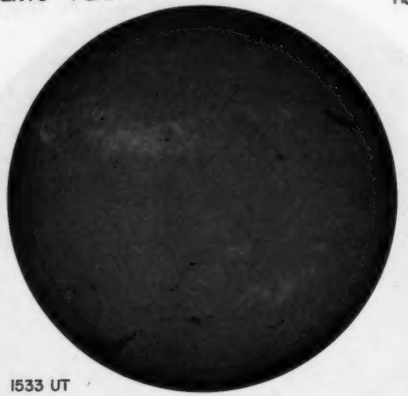
1334 UT

MT. WILSON



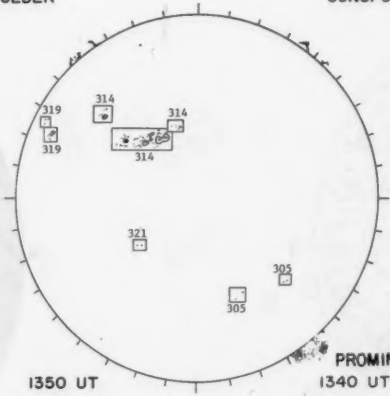
16.12 - 17.50 UT

SACRAMENTO PEAK Np Hα



1533 UT

BOULDER Np SUNSPOTS

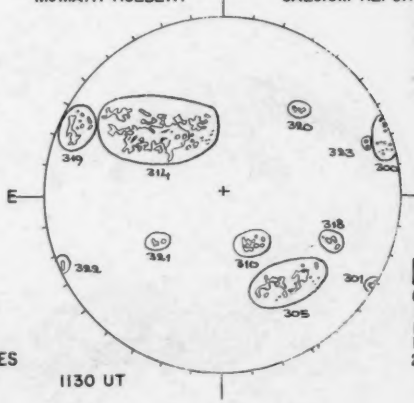


1350 UT

PROMINENCES

1340 UT

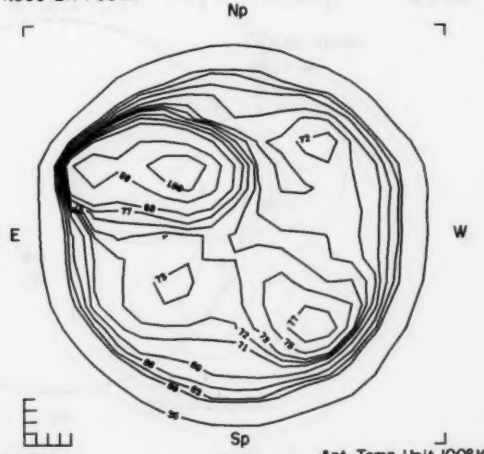
McMATH-HULBERT Np CALCIUM REPORT



1130 UT

GOOD	D
05 - 2700 - 2.5	
10 - 0600 - 2.5	
14 - 11300 - 3.5	
19 - 2500 - 4.0	
22 - 0800 - 2.5	

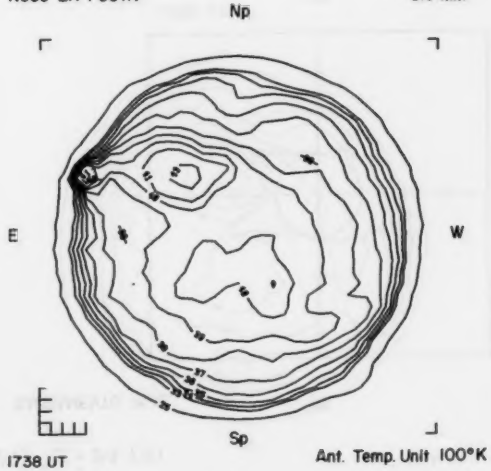
NOSC LA POSTA 2.0 CM Np



1857 UT

Ant. Temp. Unit 100°K

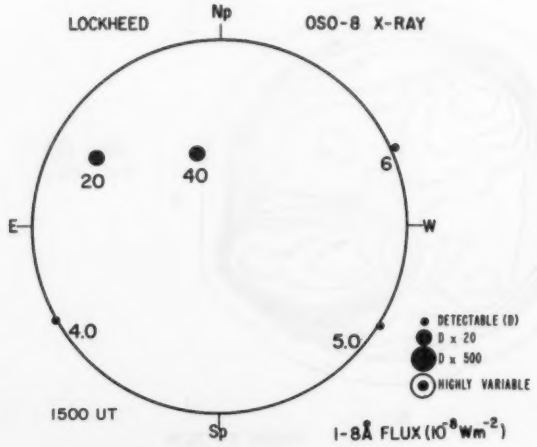
NOSC LA POSTA 8.6 MM Np

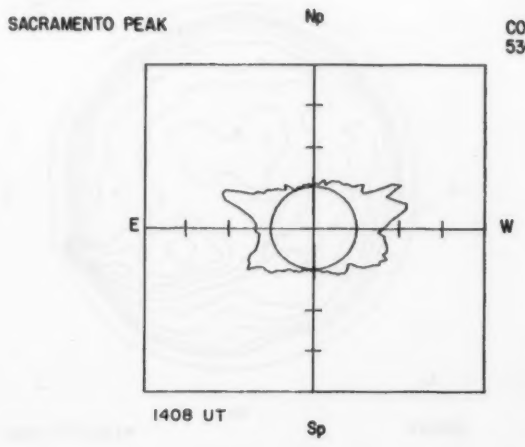


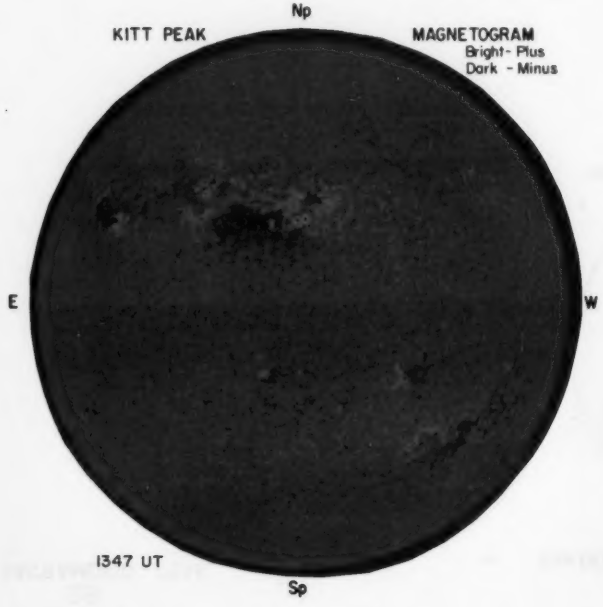
1738 UT

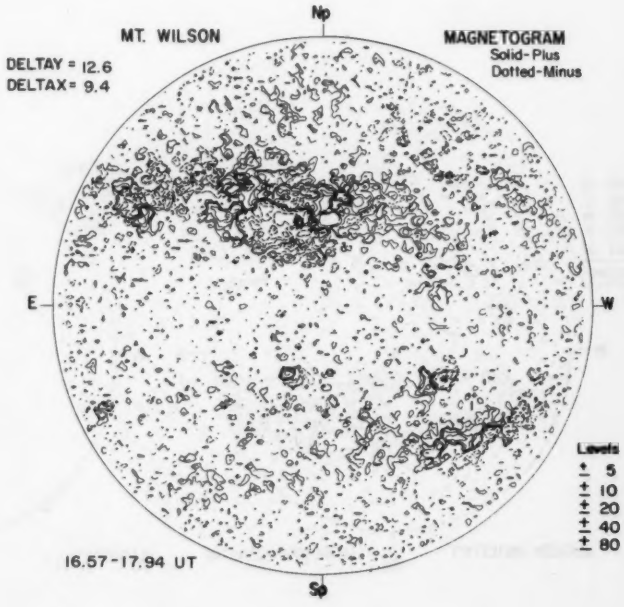
Ant. Temp. Unit 100°K

MAY 27, 1978 (P=-17.39, B_o=-1.27, L_o=94.79)



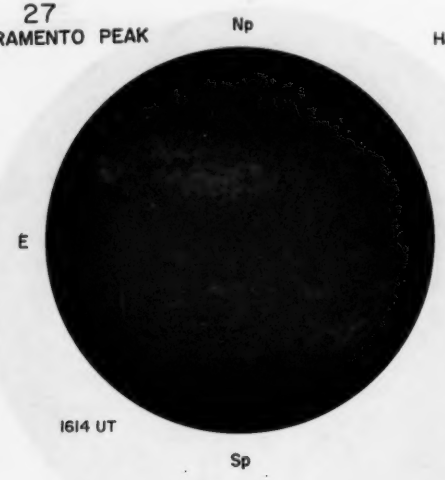




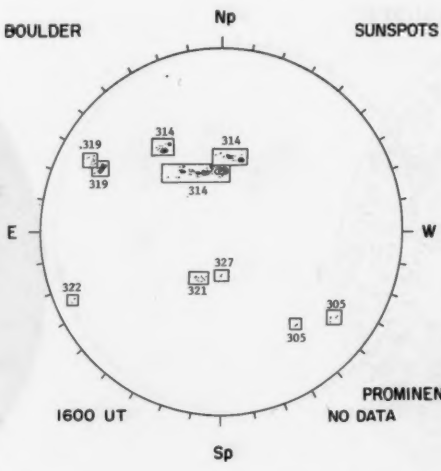


27

SACRAMENTO PEAK



Hα BOULDER

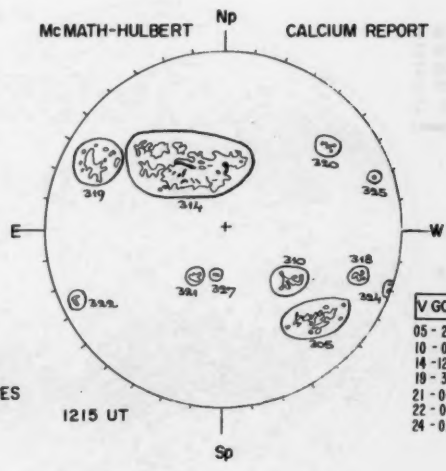


SUNSPOTS

PROMINENCES

NO DATA

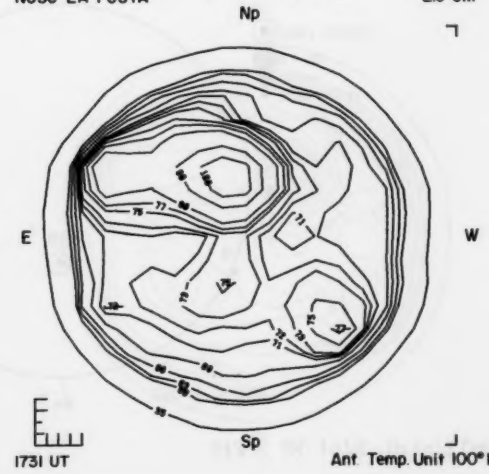
McMATH-HULBERT



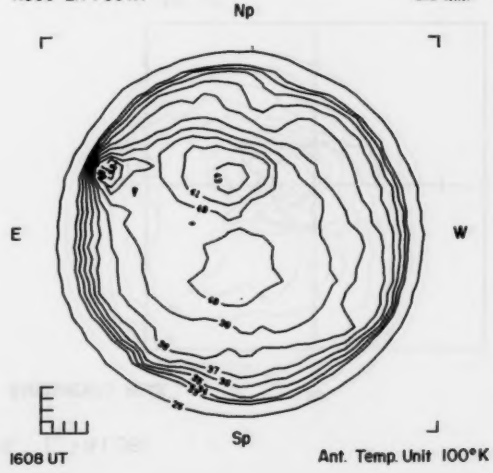
CALCIUM REPORT

V GOOD	M
05 - 2700 - 2.5	
10 - 0600 - 2.5	
14 - 12000 - 3.5	
19 - 3100 - 3.0	
21 - 0400 - 2.5	
22 - 0700 - 2.5	
24 - 0300 - 3.0	

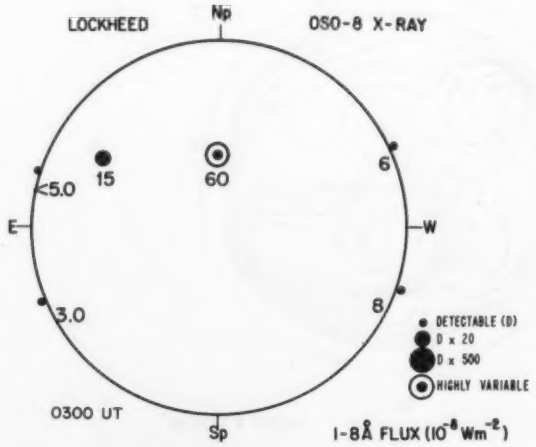
NOSC LA POSTA 2.0 CM

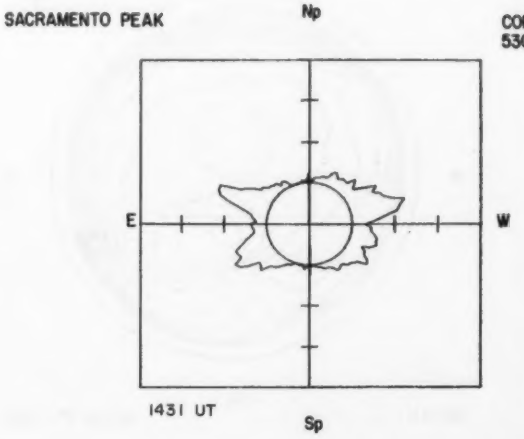


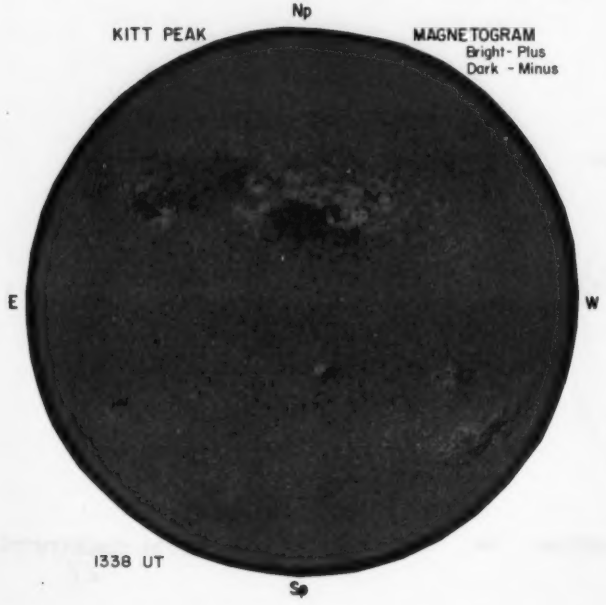
NOSC LA POSTA 8.6 MM

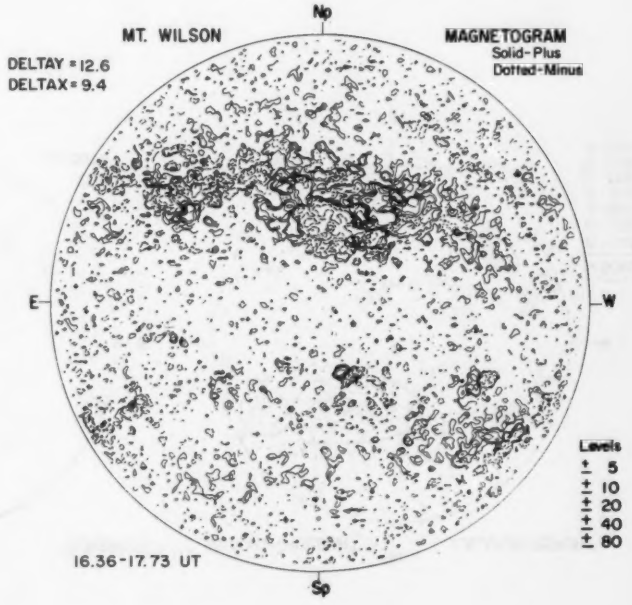


MAY 28, 1978 (P=-17.04, B_0=-1.15, L_0=81.56)



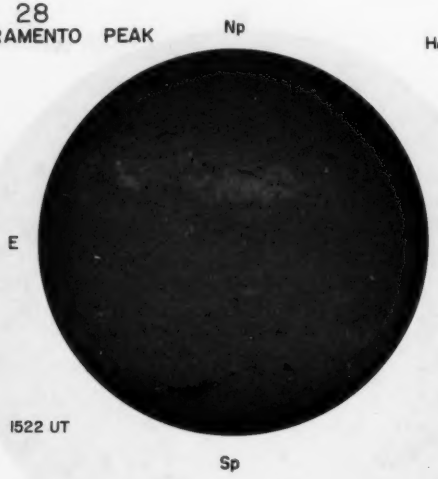




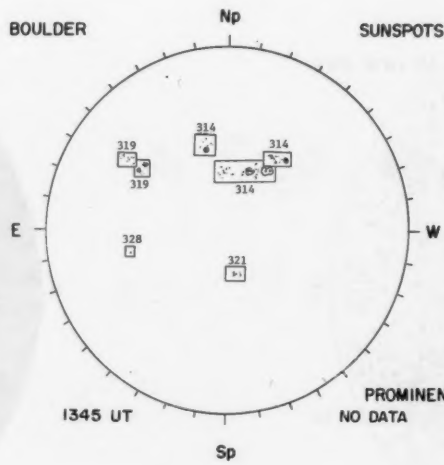


28

SACRAMENTO PEAK



Hα BOULDER



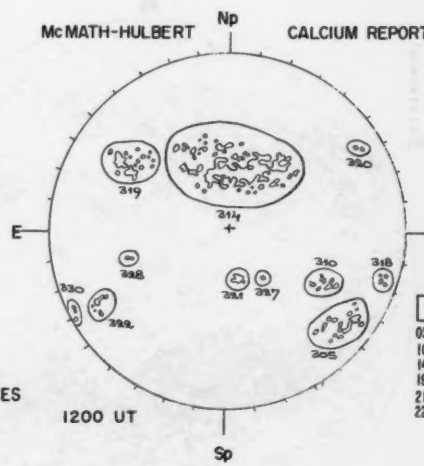
SUNSPOTS

PROMINENCES

NO DATA

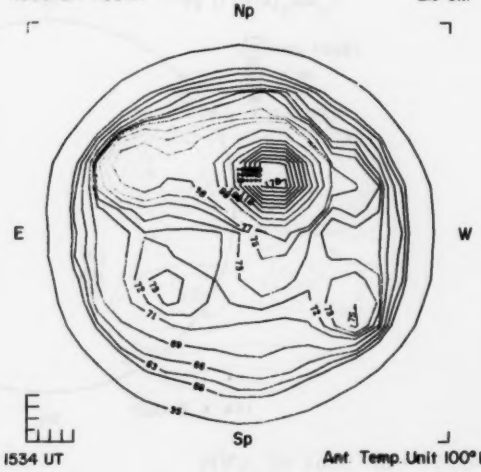
McMATH-HULBERT

CALCIUM REPORT

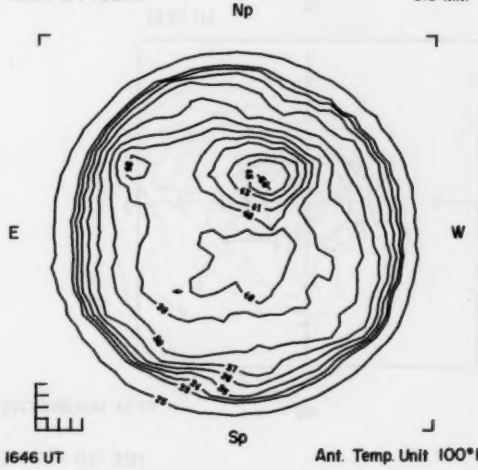


GOOD	D
05 - 2700 - 2.5	
10 - 0600 - 2.5	
14 - 10700 - 3.5	
19 - 3100 - 3.0	
21 - 0400 - 3.0	
22 - 0900 - 2.5	

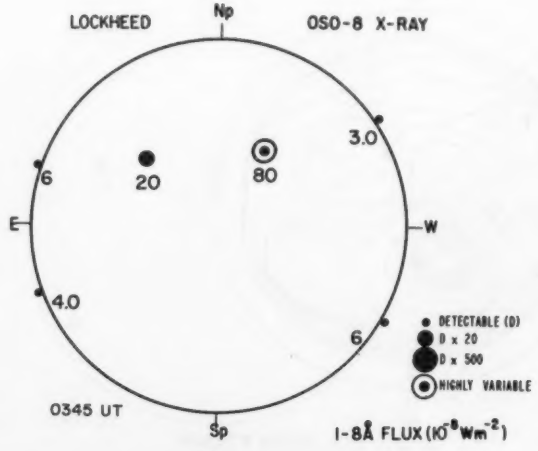
NOSC LA POSTA 2.0 CM

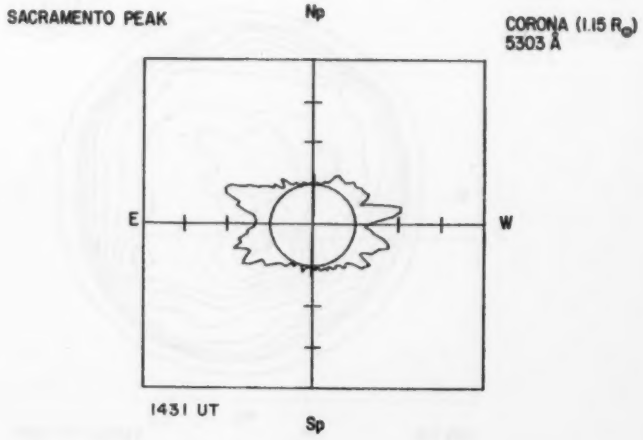


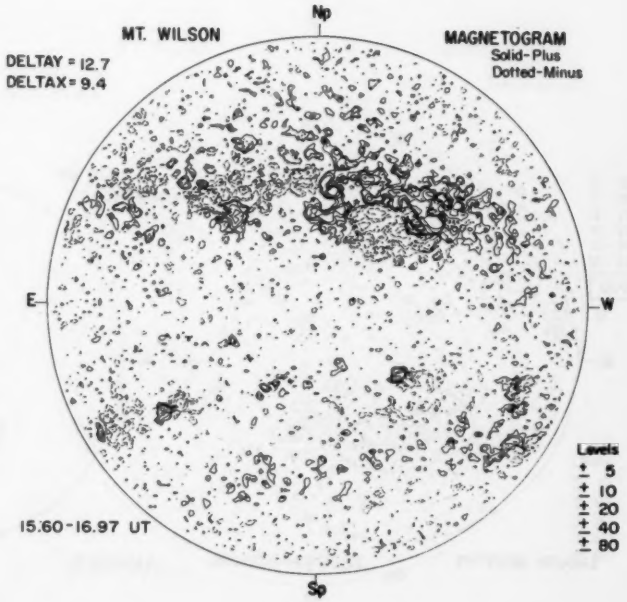
NOSC LA POSTA 8.6 MM



MAY 29, 1978 (P=-16.68, B_o=-1.03, L_o=68.33)

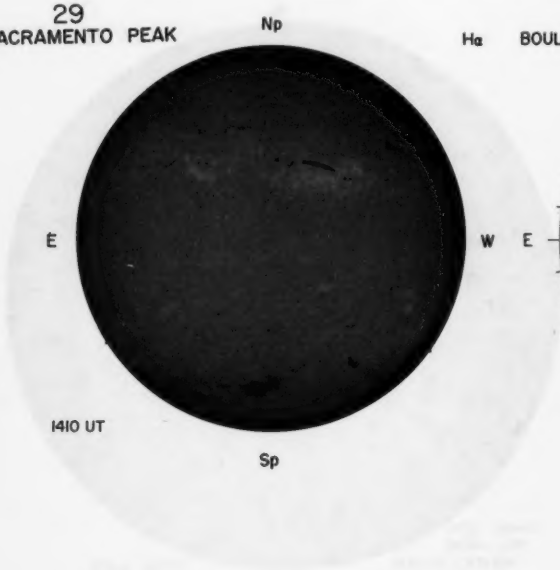




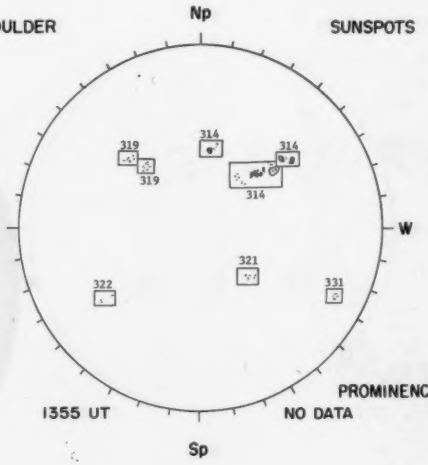


29

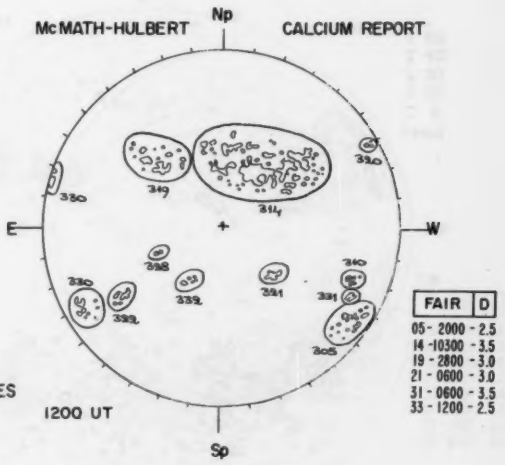
SACRAMENTO PEAK



BOULDER



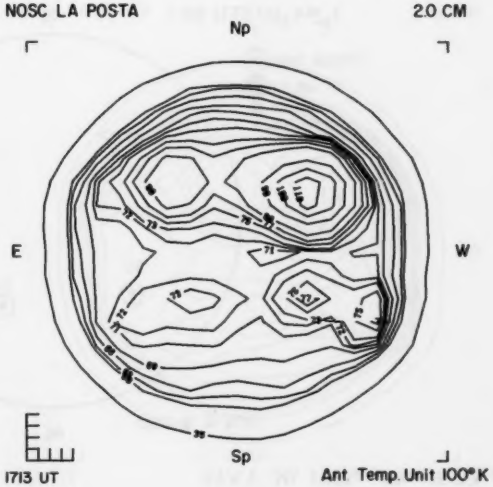
McMATH-HULBERT



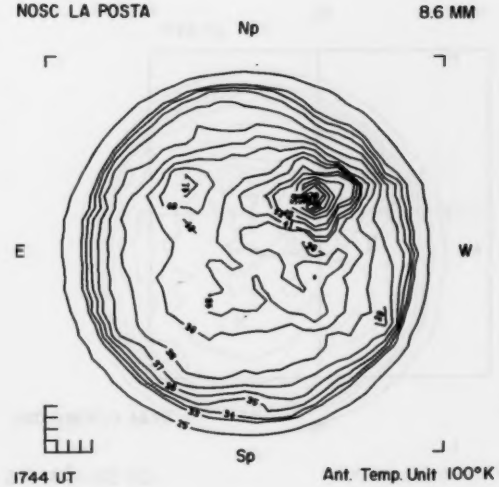
PROMINENCES

NO DATA

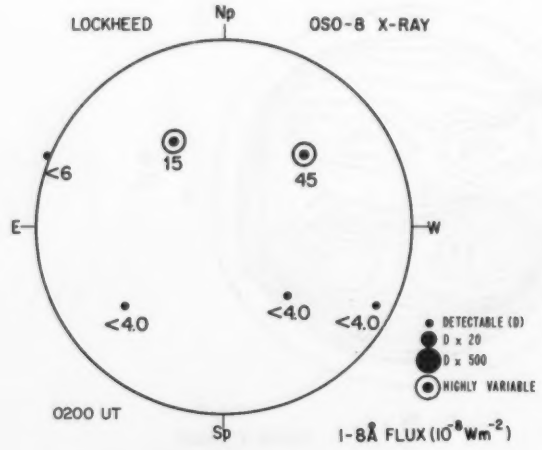
NOSC LA POSTA

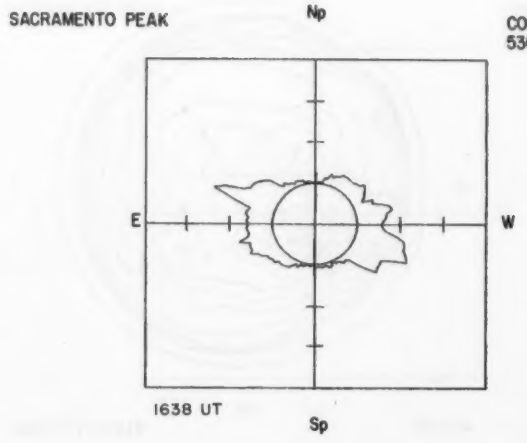


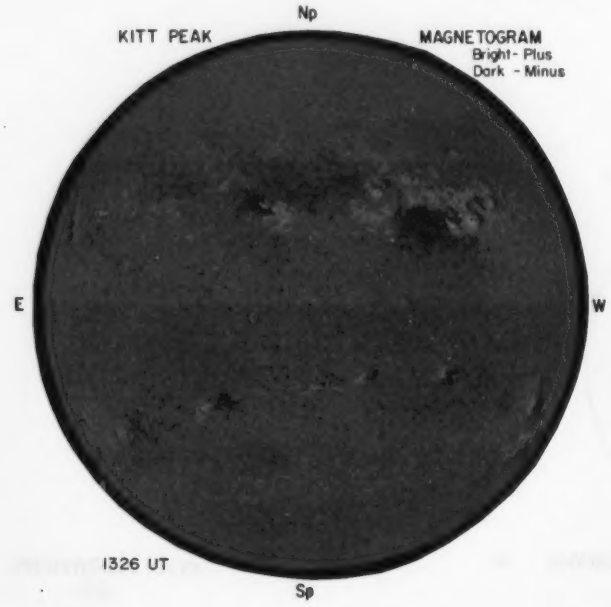
NOSC LA POSTA

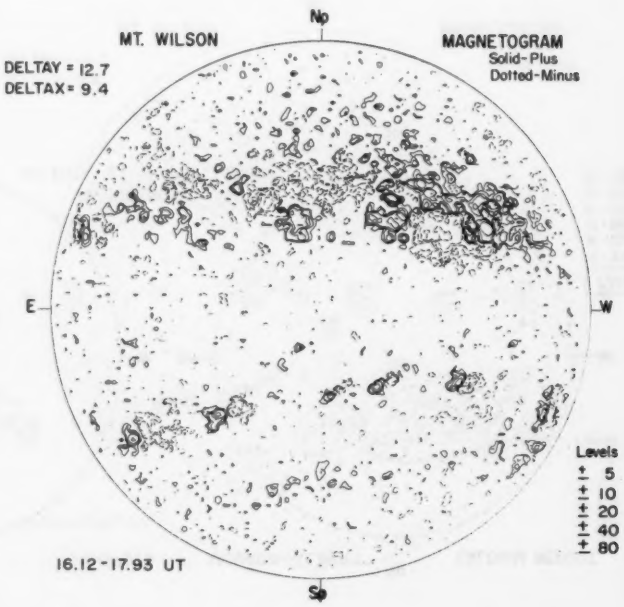


MAY 30, 1978 (P = -16.33, B_o = -0.91, L_o = 55.10)



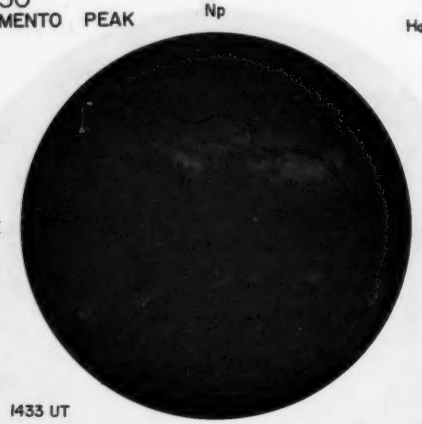






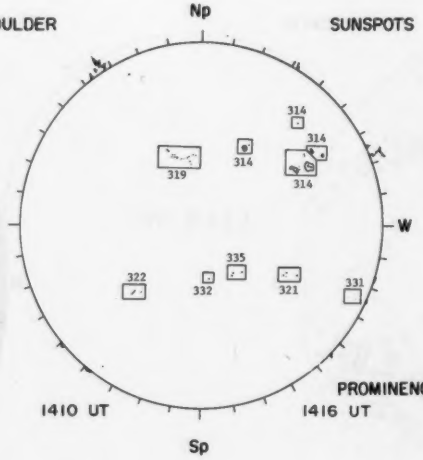
30

SACRAMENTO PEAK



1433 UT

Hα BOULDER



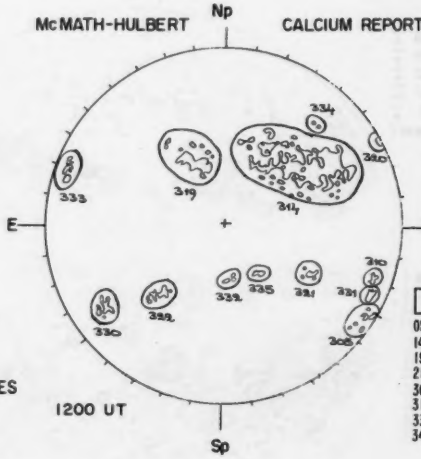
1410 UT

SUNSPOTS

PROMINENCES

1416 UT

McMATH-HULBERT

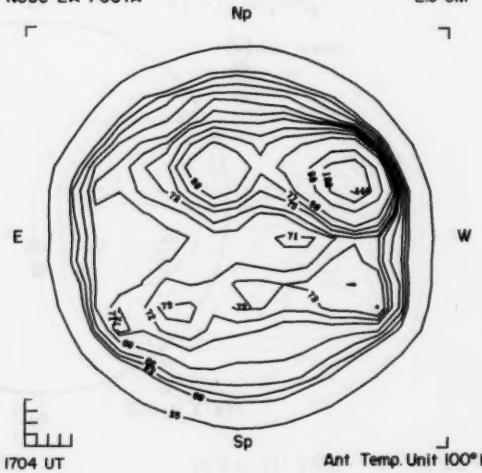


1200 UT

CALCIUM REPORT

FAIR	D
05 - 0900 - 2.6	
14 - 1500 - 3.5	
19 - 3200 - 3.0	
21 - 0500 - 2.5	
30 - 1200 - 3.5	
31 - 1200 - 3.5	
33 - 1800 - 3.5	
34 - 0200 - 3.0	

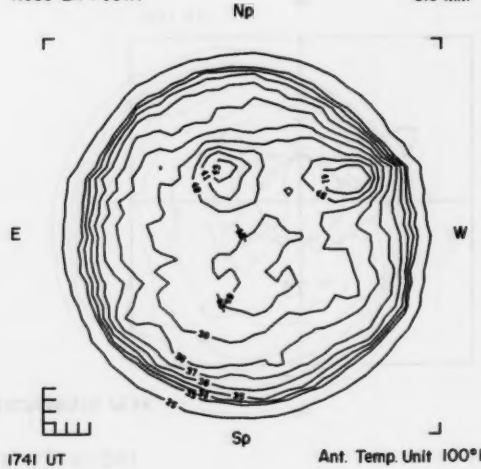
NOSC LA POSTA 2.0 CM



1704 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

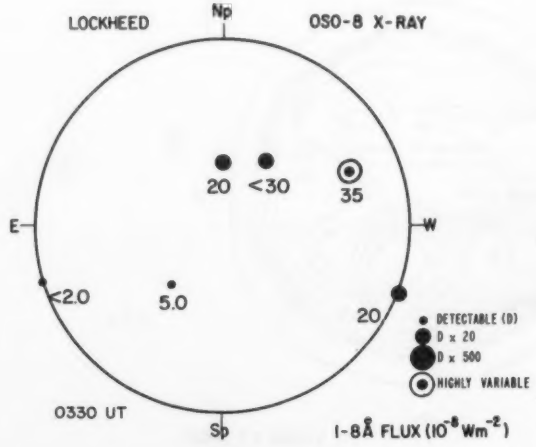


1741 UT

Ant. Temp. Unit 100°K

MAY 31, 1978 (P=-15.96, B_o=-0.79, L_o=41.86)

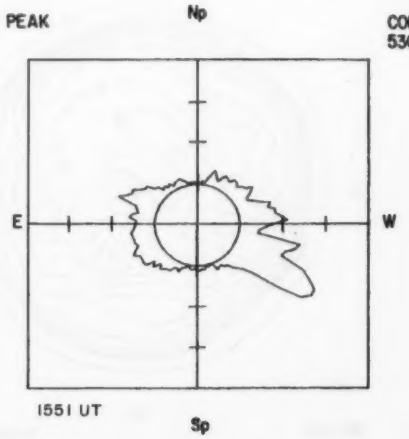
LOCKHEED OSO-8 X-RAY



0330 UT

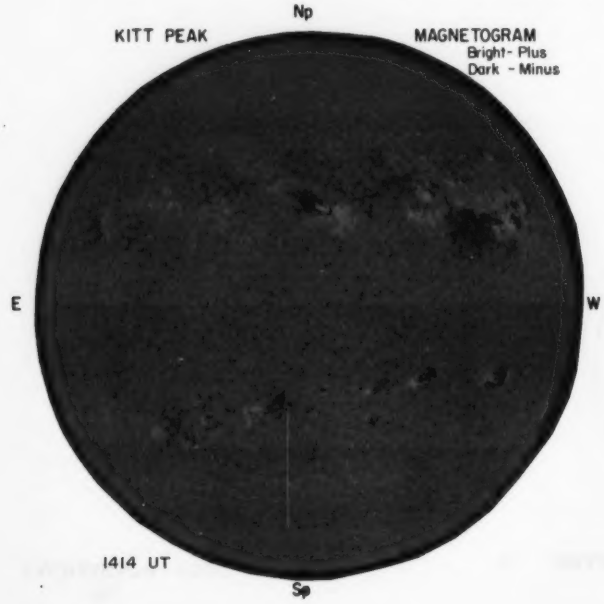
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK



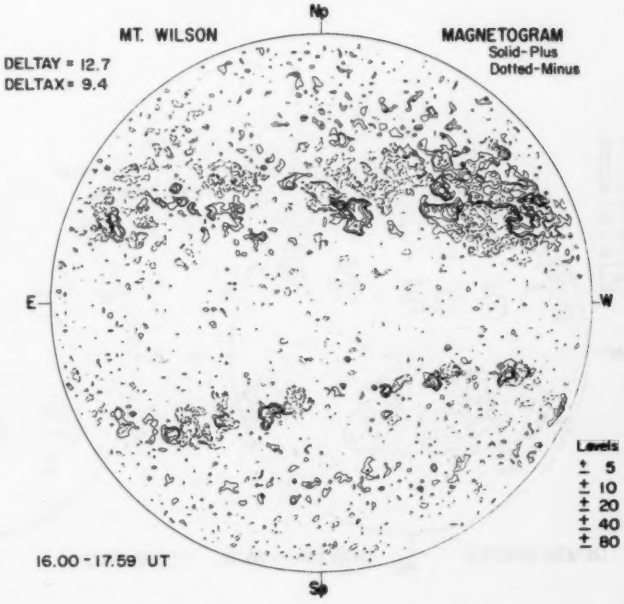
1551 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1414 UT

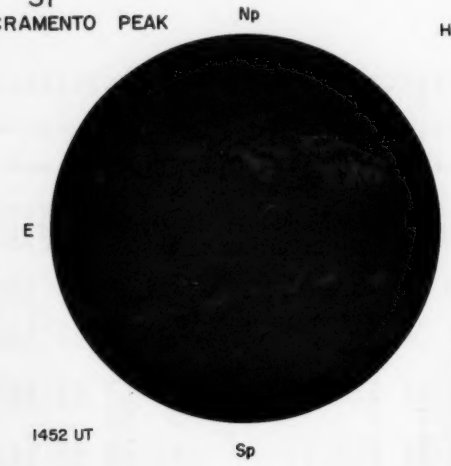
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.7
DELTAX = 9.4



16.00 - 17.59 UT

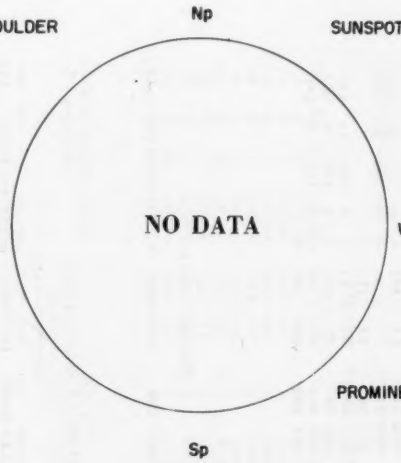
31

SACRAMENTO PEAK



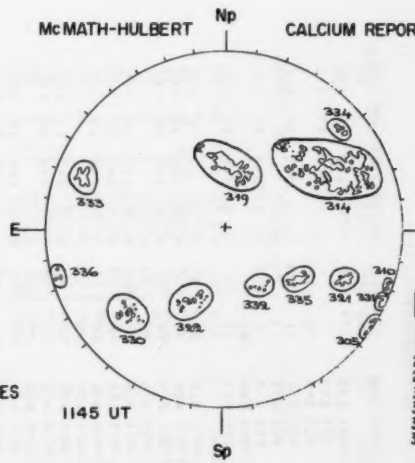
1452 UT

Hα BOULDER



SUNSPOTS

McMATH-HULBERT



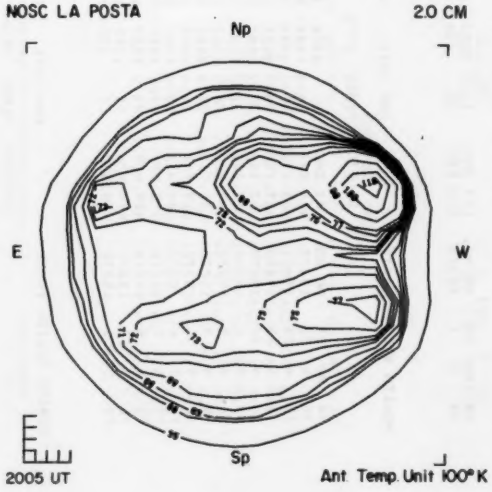
1145 UT

CALCIUM REPORT

GOOD	S
14 - 1400 - 5.0	
19 - 3000 - 3.0	
21 - 0800 - 3.0	
22 - 0700 - 2.5	
31 - 1500 - 3.0	
33 - 1600 - 2.5	
34 - 0600 - 2.5	
35 - 0700 - 2.5	

PROMINENCES

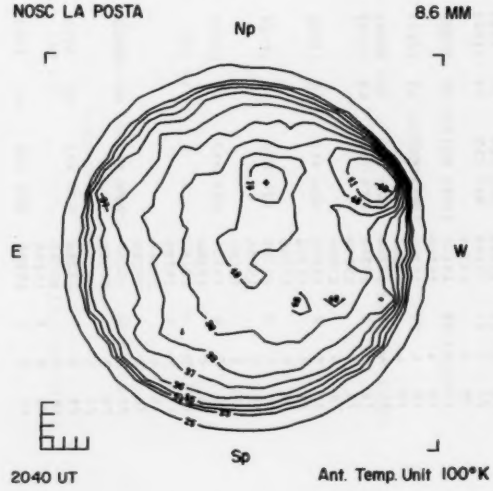
NOSC LA POSTA 2.0 CM



2005 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



2040 UT

Ant. Temp. Unit 100°K

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15266 CMP DATE 1.8 — RETURN OF REGION 15214 AND NEW ROTATION 4 AND 1

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	4	24	15266	N22 E85	77	1200	1.5									
78	4	25	15266	N22 E75	76	5500	3.5		N23 E75				B	600	5	ESO
78	4	26	15266	N22 E65	74	8500	3.5		N23 E59				B	950	19	EKI
78	4	27	15266	N23 E55	69	11000	3.5	20018	N19 E44	79	(D)	4				
78	4		15266					20019	N25 E52	71	(B)	5	B	820	23	EKI
78	4	28	15266	N24 E43	68	11500	3.5	20018	N20 E31	79	(D)	4				
78	4		15266					20019	N24 E38	72	(BP)	5	B	1000	24	EKC
78	4	29	15266	N23 E30	69	12000	3.5	20018	N20 E15	81	D	4				
78	4		15266					20019	N24 E23	73	BP	5	B	880	37	EKC
78	4	30	15266	N23 E16	70	12000	3.5									
78	5	1	15266	N24 E04	68	12000	3.5	20018	N20 W12	81	Y	5	H	10	2	BXO
78	5		15266					20019	N25 W04	73	B	5	H	990	39	EKC
78	5		15266					20020	N24 E15	54	BP	4	H	280	24	EKI
78	5	2	15266	N24 W10	68	13000	3.5	20018	N19 W24	80	(D)	4				
78	5		15266					20019	N24 W16	72	(BP)	5	R	1120	90	FKC
78	5		15266					20020	N23 E04	52	(D)	4	R	440	50	FKI
78	5	3	15266	N24 W23	68	12700	3.5	20018	N19 W36	80	(D)	4	B	1150	15	FKI
78	5		15266					20019	N24 W29	73	(Y)	5				
78	5		15266					20020	N23 W08	52	(D)	4	B	240	11	EKI
78	5	4	15266	N24 W33	65	12300	3.5	20018	N19 W50	81	(D)	5	B	740	20	FKI
78	5		15266					20019	N26 W46	77	(AP)	4				
78	5		15266					20020	N23 W24	55	(BP)	4	B	190	17	ESI
78	5	5	15266					20018	N21 W64	81	(D)	4	R	880	37	FKC
78	5		15266					20019	N27 W56	73	(AP)	4				
78	5		15266					20020	N24 W46	63	(AP)	4	R	170	25	DSI
78	5	6	15266	N24 W63	66	11000	3.5	20018	N20 W73	77	(D)	4	H	1080	15	FKI
78	5		15266					20019	N27 W69	73	(AP)	4				
78	5		15266					20020	N23 W55	59	(Y)	4	H	990	17	FKC
78	5	7	15266	N25 W73	66	9500	3.5	20019	N26 W65	76	AP	3	B	130	1	HSX
78	5		15266					20020	N22 W67	58	(D)	4	B	310	8	EKO
78	5	8	15266					20020	N22 W80	58	Y	3				
78	5	9	15266	N25 W80	47	2000	2.0									

MCMATH REGION 15278 CMP DATE 4.1

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	1	15278	S30 E35	37	100	1.0									

MCMATH REGION 15270 CMP DATE 4.7 — RETURN OF REGION 15221 ROTATION 4

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	4	27	15270	N19 E80	44	600	1.5	20020	N23 E74	49	(B)	4				
78	4	28	15270	N23 E70	41	1300	2.0	20020	N23 E58	52	(BP)	4	B	240	4	EHO
78	4	29	15270	N23 E66	33	2400	2.0	20020	N23 E43	53	BP	4	B	390	14	EHI
78	4	30	15270	N23 E54	32	2500	2.5									
78	5	1	15270	N23 E40	32	2500	2.5									
78	5	2	15270	N24 E26	32	2600	2.0		N25 E13				R	30	5	CRO
78	5	3	15270	N25 E15	30	2800	2.0									
78	5	4	15270	N25 E03	29	2800	2.0									
78	5	6	15270	N25 W23	26	2800	2.5		N23 W24				R	10	1	AXX
78	5	7	15270	N25 W37	30	2700	2.5									
78	5	9	15270	N25 W65	32	2000	1.0									
78	5	10	15270	N25 W76	30	1000	1.0									
78	5	11	15270	N25 W88	29	500	1.0									

MCMATH REGION 15279 CMP DATE 5.1

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	4	29	15279	S23 E78	21	200	1.0									
78	4	30	15279	S23 E63	23	400	1.5									
78	5	1	15279	S23 E49	23	300	2.0		S23 E42				H	10	4	BXO
78	5	2	15279	S23 E35	23	300	1.5		S23 E35				R	30	3	CRO
78	5	3	15279	S23 E21	24	200	1.0									
78	5	4	15279	S23 E08	24	200	1.0									
78	5	6	15279	S23 W20	23	200	1.0									
78	5	7	15279	S23 W31	24	200	1.5									
78	5	9	15279	S23 W57	24	300	1.0									
78	5	10	15279	S23 W71	25	300	2.5									

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15285 CMP DATE 5.2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	6	15285	S18 W20	23	200	1.0		S19 W23				H	10	1	AXX
78	5	7	15285	S17 W30	23	200	1.5									

MCMATH REGION 15276 CMP DATE 6.3 RETURN OF REGION 15227 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	4	29	15276	S26 E90	9	300	1.0									
78	4	30	15276	S26 E80	6	500	1.0									
78	5	1	15276	S26 E65	7	500	1.5									
78	5	2	15276	S26 E51	7	500	1.5									
78	5	3	15276	S26 E38	7	500	1.5									
78	5	4	15276	S27 E25	7	500	1.5									
78	5	6	15276	S27 W06	9	400	2.0									
78	5	7	15276	S27 W14	7	300	1.5									
78	5	9	15276	S27 W40	7	500	2.0									
78	5	10	15276	S27 W53	7	300	2.0									
78	5	11	15276	S27 W64	5	400	2.5									
78	5	12	15276	S27 W80	2	400	2.5	20030	S26 W77	2	X	1	B	10	1	AXX

MCMATH REGION 15275 CMP DATE 6.5 RETURN OF REGION 15229 ROTATION 3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	4	30	15275	N18 E80	6	900	1.5									
78	5	1	15275	N18 E65	7	800	1.5									
78	5	2	15275	N18 E53	5	900	1.5									
78	5	3	15275	N18 E40	5	800	1.5									
78	5	4	15275	N18 E26	6	800	1.5									
78	5	6	15275	N18 W03	6	900	1.5									
78	5	7	15275	N18 W14	7	900	1.5									
78	5	9	15275	N18 W40	7	800	1.0									
78	5	10	15275	N18 W53	7	700	1.0		N19 W53				B	190	8	DSI
78	5	11	15275	N18 W65	6	600	1.0		N17 W58				H	30	2	HSX

MCMATH REGION 15280 CMP DATE 7.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	4	30	15280	S27 E90	357	300	2.0									
78	5	1	15280	S26 E80	353	1800	3.0	20023	S27 E70	8	B	3				
78	5	2	15280	S27 E68	351	2700	2.5	20023	S27 E68	349	(B)	3	R	360	18	EAI
78	5	3	15280	S27 E55	351	2900	2.5	20023	S28 E55	350	(B)	3	B	260	7	ESI
78	5	4	15280	S27 E44	349	2400	2.5	20023	S28 E42	350	(B)	4	B	240	11	OAI
78	5	5	15280					20023	S28 E31	347	(B)	3	R	150	36	DAI
78	5	6	15280	S28 E14	350	2300	3.0	20023	S28 E18	347	(B)	4	H	160	17	DSO
78	5	7	15280	S28 E05	348	2300	2.5	20023	S28 E04	347	(B)	4	B	80	11	ESI
78	5	8	15280					20023	S28 W07	345	(B)	3	B	60	7	DSO
78	5	9	15280	S28 W19	346	2500	3.0	20023	S28 W21	346	(B)	3	B	30	7	DSO
78	5	10	15280	S28 W32	346	2500	3.0	20023	S27 W35	347	(AP)	3	B	10	2	CRO
78	5	11	15280	S27 W46	347	2200	2.5	20023	S28 W48	347	(B)	4	H	10	2	BXO
78	5	12	15280	S27 W62	344	2000	2.5									
78	5	13	15280	S26 W82	354	2000	2.5									
78	5	14	15280	S26 W87	346	1200	2.5									

MCMATH REGION 15282 CMP DATE 7.9 RETURN OF REGION 15231 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	2	15282	N20 E78	341	900	2.0	20024	N16 E74	343	B	1	R	10	2	BXO
78	5	3	15282	N19 E61	345	2100	3.0	20024	N17 E58	347	(B)	3	B	100	4	CSO
78	5	4	15282	N18 E46	347	1800	3.0	20024	N17 E42	350	(B)	5	B	130	6	CSI
78	5	5	15282					20024	N17 E29	349	(B)	4	R	140	9	DSO
78	5	6	15282	N17 E16	348	1800	2.5	20024	N17 E15	350	(B)	4	H	100	6	DSO
78	5	7	15282	N17 E05	348	1900	2.5	20024	N17 W01	352	(AP)	5	B	40	1	HSX
78	5	8	15282					20024	N17 W13	351	(AP)	4	B	30	1	HSX
78	5	9	15282	N17 W21	348	1500	2.5	20024	N18 W27	352	(AP)	4	B	20	1	HSX
78	5	10	15282	N17 W34	348	1300	2.5	20024	N18 W40	352	(AP)	4				
78	5	11	15282	N17 W47	348	1000	2.0	20024	N18 W53	352	(AP)	4				
78	5	12	15282	N17 W65	347	1200	2.0	20024	N17 W67	352	(AP)	4	B	20	1	HRX

(CON'T)

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15282 (CONT) CMP DATE 7.9 RETURN OF REGION 15231 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	13	15282	N17 W76	348	1000	2.0	20024	N18 W80	353	AP	1				

MCMATH REGION 15299 CMP DATE 8.9

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	12	15299	N16 W52	334	300	1.5									
78	5	13	15299	N17 W62	334	300	2.0									
78	5	14	15299	N17 W75	334	300	2.0									

MCMATH REGION 15283 CMP DATE 9.0

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	2	15283	S19 E90	329	100	1.0									
78	5	3	15283	S18 E78	328	300	1.5									
78	5	4	15283	S18 E63	330	300	1.5									
78	5	6	15283	S19 E32	332	100	1.5									
78	5	7	15283	S19 E20	333	100	1.0									

MCMATH REGION 15286 CMP DATE 9.6 RETURN OF REGION 15232 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	3	15286	S28 E75	331	400	1.0									
78	5	4	15286	S29 E60	333	300	1.0									
78	5	7	15286	S29 E25	328	400	1.5		S27 E26			H		190	20	DSI
78	5	9	15286	S29 E01	326	400	1.5									
78	5	10	15286	S29 W12	326	600	1.5									
78	5	11	15286	S28 W25	326	600	1.5									
78	5	12	15286	S28 W42	324	400	1.0									
78	5	13	15286	S27 W51	323	400	1.5									
78	5	14	15286	S28 W64	323	400	1.5									
78	5	15	15286	S28 W75	319	200	1.0									

MCMATH REGION 15287 CMP DATE 9.6

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	6	15287	N17 E39	325	100	1.5		N16 E34			H		10	1	AXX
78	5	7	15287	N17 E28	325	200	1.0									

MCMATH REGION 15288 CMP DATE 10.5

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	6	15288	N29 E50	314	100	1.5									
78	5	7	15288	N29 E40	313	200	1.5									
78	5	9	15288	N29 E13	314	200	1.5									

MCMATH REGION 15295 CMP DATE 10.9

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	9	15295	S13 E18	309	200	1.5									
78	5	10	15295	S13 E05	309	200	1.5									
78	5	11	15295	S13 W11	312	200	2.0									
78	5	12	15295	S14 W31	313	200	1.5									
78	5	13	15295	S13 W42	314	300	2.5	20032	S14 W42	315	AP	1				
78	5	14	15295	S15 W56	315	300	3.0	20032	S15 W57	316	(AP)	2	B	10	1	AXX
78	5	15	15295	S15 W71	315	500	3.0		S15 W73				H	20	3	BXO
78	5	16	15295	S14 W82	316	700	2.5		S16 W81				R	10	2	BXO

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15289 — CMP DATE 11.1 — RETURN OF PART OF REGION 15233 — ROTATION 3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	6	15289	S34 E56	308	300	1.5									
78	5	7	15289	S34 E46	307	300	1.5									
78	5	9	15289	S34 E20	307	500	2.0									
78	5	10	15289	S34 E08	306	400	2.0									
78	5	11	15289	S35 W04	305	400	2.0									
78	5	12	15289	S35 W20	302	300	1.5									
78	5	13	15289	S35 W30	302	300	1.5									
78	5	14	15289	S35 W42	301	200	1.5									
78	5	15	15289	S35 W56	300	100	1.5									
78	5	16	15289	S35 W65	299	100	1.5									
78	5	17	15289	S35 W78	299	200	1.0									

MCMATH REGION 15292 — CMP DATE 11.8 — RETURN OF REGION 15240 — ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	6	15292	S20 E70	294	300	1.5									
78	5	7	15292	S21 E60	293	400	1.5									
78	5	9	15292	S21 E32	295	400	1.5									
78	5	10	15292	S21 E18	296	400	1.0									
78	5	11	15292	S21 E04	297	300	1.0									
78	5	12	15292	S22 W14	296	200	1.0									
78	5	13	15292	S22 W24	296	400	2.5	20033	S25 W28	301	(AP)	1	H	10	5	BXO
78	5	14	15292	S25 W38	297	400	2.5	20033	S25 W40	299	(B)	3	B	10	4	BXO
78	5	15	15292	S25 W55	299	300	2.0		S25 W57				H	0	1	AXX
78	5	16	15292	S25 W66	300	700	3.5		S27 W68				R	10	3	BXO
78	5	17	15292	S25 W79	300	700	3.5									

MCMATH REGION 15293 — CMP DATE 12.1 — RETURN OF PART OF REGION 15233 — ROTATION 3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	6	15293	S34 E74	290	600	1.0									
78	5	7	15293	S34 E65	288	800	1.5									
78	5	9	15293	S34 E38	289	900	2.0									
78	5	10	15293	S34 E26	288	700	2.0									
78	5	11	15293	S33 E08	293	500	1.0									
78	5	12	15293	S33 W08	290	300	1.5									
78	5	13	15293	S33 W18	290	400	2.0									
78	5	14	15293	S33 W29	288	400	2.0									
78	5	15	15293	S33 W43	287	400	2.0									
78	5	16	15293	S33 W52	286	300	1.5									
78	5	17	15293	S33 W64	285	300	1.0									
78	5	18	15293	S33 W70	278	400	1.0									

MCMATH REGION 15291 — CMP DATE 12.2 — RETURN OF REGIONS 15235 AND 15239 ROTATIONS 3 AND 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	6	15291	N17 E75	289	3200	3.0	20025	N17 E83	282	(B	4	H	440	10	FSI
78	5	7	15291	N17 E65	288	5500	3.5	20025	N17 E60	291	(BP)	5	B	170	6	ESO
78	5		15291					20026	N17 E70	281	(BP)	4				
78	5	8	15291					20025	N16 E45	293	(B)	4	B	60	6	DRO
78	5		15291					20026	N16 E53	285	(AP)	4				
78	5	9	15291	N17 E35	292	5000	3.0	20025	N16 E30	295	(B)	4	B	20	6	CSO
78	5		15291					20026	N17 E39	286	(AP)	5	B	100	1	HSX
78	5	10	15291	N17 E22	292	4700	3.0	20025	N16 E13	299	(AP)	4	B	40	4	DRO
78	5		15291					20026	N17 E27	285	(AP)	5	B	130	1	HSX
78	5	11	15291	N17 E09	292	4400	3.0	20025	N16 E01	298	(AP)	3	H	40	4	CRO
78	5		15291					20026	N17 E14	285	(AP)	5	H	100	4	CSO
78	5	12	15291	N17 W10	292	4200	3.0	20025	N16 W13	298	(AP)	3	B	20	2	AXX
78	5		15291					20026	N17 E01	284	(AP)	6	B	90	2	HSX
78	5	13	15291	N17 W20	292	4300	3.0	20025	N17 W26	299	(AP)	2	H	0	1	AXX
78	5		15291					20026	N17 W12	285	(AP)	5	H	60	1	HSX
78	5	14	15291	N17 W33	292	3800	3.0	20026	N17 W26	285	(AP)	5	B	140	1	HSX
78	5	15	15291	N17 W47	291	3800	2.5		N16 W44				H	110	1	HSX
78	5	16	15291	N17 W59	293	3500	2.5	20026	N18 W58	287	(AP)	3	R	110	1	HSX
78	5	17	15291	N17 W72	293	3100	2.5	20026	N18 W68	287	(AP)	3	B	110	1	HSX
78	5	18	15291	N17 W85	293	1400	2.0	20026	N18 W82	288	(AP)	2	B	100	1	HSX

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15302 CMP DATE 12.6

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	14	15302	N35 W27	286	100	1.5									
78	5	15	15302	N36 W39	283	100	1.0									
78	5	16	15302	N36 W49	283	200	1.0									
78	5	17	15302	N36 W61	282	300	3.0									
78	5	18	15302	N36 W72	280	300	2.0									

MCMATH REGION 15297 CMP DATE 13.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	11	15297	S33 E33	268	300	2.0	20029	S33 E34	265	(B)	3	H	20	2	BXO
78	5	12	15297	S33 E15	267	200	1.5		S31 E19				B	10	2	BXO
78	5	13	15297	S33 E04	268	200	1.5									
78	5	14	15297	S33 W07	266	300	1.5									

MCMATH REGION 15294 CMP DATE 14.3 RETURN OF REGION 15254 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	7	15294	N19 E90	263	800	2.5									
78	5	9	15294	N20 E62	265	1500	2.5	20027	N19 E60	265	(AP)	3	B	10	1	AXX
78	5	10	15294	N20 E50	264	1500	2.5		N18 E47				B	10	1	AXX
78	5	11	15294	N19 E37	264	1600	3.0									
78	5	12	15294	N19 E19	263	1500	2.5									
78	5	13	15294	N19 E09	263	1200	2.5									
78	5	14	15294	N19 W03	262	1000	2.0									
78	5	15	15294	N19 W18	262	1000	2.0									
78	5	16	15294	N19 W29	263	1000	2.0									
78	5	17	15294	N19 W42	263	1000	2.0									
78	5	18	15294	N19 W55	263	1000	2.0		N18 W60				B	10	1	AXX
78	5	19	15294	N19 W70	265	1200	2.5	20039	N18 W77	271	(AP)	2				
78	5	20	15294	N19 W84	266	600	1.0									

MCMATH REGION 15296 CMP DATE 14.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	9	15296	S19 E72	255	2400	3.5	20028	S20 E67	258	(BP)	4	B	50	5	DSI
78	5	10	15296	S20 E59	255	2500	3.5	20028	S20 E55	257	(BP)	4				
78	5	11	15296	S20 E44	257	2500	3.5	20028	S21 E42	257	(BP)	5	H	150	8	DAO
78	5	12	15296	S20 E26	256	3000	3.5	20028	S21 E29	256	(BP)	4	B	110	13	DAI
78	5	13	15296	S20 E15	257	3200	3.5	20028	S21 E15	258	(BP)	4	H	200	18	EAI
78	5	14	15296	S20 E02	257	3000	3.0	20028	S21 E00	259	(BP)	4	B	140	34	DSI
78	5	15	15296	S20 W13	257	2800	3.0		S21 W15				H	190	12	DAI
78	5	16	15296	S20 W24	258	2800	3.0	20028	S22 W29	259	(B)	3	R	80	11	DAO
78	5	17	15296	S20 W36	257	3000	3.0	20028	S23 W38	257	(B)	4	B	50	6	DSI
78	5	18	15296	S20 W49	257	2900	3.0	20028	S23 W50	256	(BP)	3	B	40	3	DSO
78	5	19	15296	S20 W61	256	2700	3.5	20028	S23 W65	259	(B)	2	B	120	8	DRI
78	5	20	15296	S20 W74	256	2500	3.5	20028	S24 W80	260	(AP)	2	B	40	3	CRO
78	5	21	15296	S23 W90	257	400	1.5									

MCMATH REGION 15298 CMP DATE 17.9 RETURN OF REGION 15255 AND PART OF 15244 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	11	15298	N20 E85	216	800	3.5		N22 E80				H	100	3	CSO
78	5	12	15298	N22 E66	216	3500	3.5	20031	N21 E70	215	(B)	4	B	230	5	CKO
78	5	13	15298	N21 E55	217	4000	3.5	20031	N21 E58	215	(B)	4	H	220	12	DAO
78	5	14	15298	N21 E42	217	4000	3.5	20031	N21 E44	215	(B)	4	B	230	35	EKI
78	5	15	15298	N21 E28	216	4000	3.0		N22 E26				H	230	28	EAI
78	5	16	15298	N22 E18	216	4000	3.5	20031	N20 E12	217	(B)	4	R	190	30	EAI
78	5	17	15298	N21 E06	215	4000	3.0	20031	N20 E02	217	(B)	4	B	100	9	EAO
78	5	18	15298	N21 W07	215	3600	3.0	20031	N21 W10	216	(B)	4	B	50	4	ESO
78	5	19	15298	N21 W20	215	3800	3.0	20031	N21 W22	216	(B)	4	B	60	9	ESO
78	5		15298					20040	N17 W15	209	(AP)	3	B	10	2	AXX
78	5	20	15298	N20 W33	215	3800	3.0	20031	N20 W36	216	(B)	4	B	30	3	DRO
78	5	21	15298	N22 W46	213	4000	3.0	20031	N20 W49	216	(B)	4	B	10	2	BXO
78	5	22	15298	N22 W58	213	3800	3.0									
78	5	23	15298	N23 W72	213	3000	2.5		N17 W63				B	10	3	BXO
78	5	24	15298	N23 W85	214	1100	2.0									

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15301 CMP DATE 19.6 RETURN OF REGION 15246 ROTATION 3

			CALCIUM		PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	12	15301	S26 E84	198	1500	3.0		S26 E87				B	30	1	HSX
78	5	13	15301	S27 E75	197	1800	4.0	20034	S27 E76	197	(AP)	4	M	130	3	CSO
78	5	14	15301	S27 E63	196	2000	3.5	20034	S28 E61	198	(BP)	4	B	130	8	CSO
78	5	15	15301	S27 E48	196	2500	3.5		S26 E46				M	150	5	CSO
78	5	16	15301	S27 E39	195	2800	3.5	20034	S28 E29	200	(AP)	4				
78	5		15301					20036	S29 E40	189	X	1	R	160	11	CKO
78	5	17	15301	S27 E27	194	3300	3.0	20034	S27 E19	200	(AP)	4	B	80	2	HSX
78	5		15301					20036	S29 E30	189	(B)	4	B	50	4	DSO
78	5	18	15301	S27 E14	194	3300	3.5	20034	S26 E06	200	(AP)	4	B	60	5	CSO
78	5		15301					20036	S28 E18	188	(Y)	4	B	80	4	DSO
78	5	19	15301	S27 E01	194	3300	3.0	20034	S26 W08	202	(AP)	3	B	100	3	HSX
78	5		15301					20036	S28 E05	189	(B)	3	B	100	13	DAO
78	5	20	15301	S27 W12	194	3500	3.0	20034	S26 W23	203	(AP)	3	B	30	7	CSI
78	5		15301					20036	S30 W06	186	(AF)	4	B	20	6	CRI
78	5	21	15301	S28 W26	193	3500	3.5	20034	S27 W35	202	(Y)	3	B	70	10	CAI
78	5		15301					20036	S30 W18	185	(AF)	3	B	0	1	AXX
78	5	22	15301	S28 W40	195	3200	3.5	20034	S27 W50	203	(BP)	3	B	120	13	DAI
78	5	23	15301	S28 W53	194	2500	3.0		S26 W61				B	30	9	CRI
78	5	24	15301	S28 W66	195	1900	3.0		S29 W73				M	40	4	CAO
78	5	25	15301	S28 W78	194	1200	2.0									
78	5	26	15301	S28 W90	193	500	1.0									

MCMATH REGION 15300 CMP DATE 20.0 RETURN OF REGION 15248 AND PART OF 15244 ROTATION 2

			CALCIUM		PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	12	15300	N17 E80	202	300	2.0									
78	5	13	15300	N16 E77	195	1500	2.0	20035	N12 E80	193	AP	3	M	90	1	HSX
78	5	14	15300	N20 E68	191	3500	3.0	20035	N12 E67	192	(AP)	3	B	120	1	HSX
78	5	15	15300	N20 E55	189	3900	3.0		N19 E52				M	10	2	BXO
78	5	16	15300	N19 E45	189	4500	3.0	20035	N12 E36	193	(AP)	5	R	120	1	HSX
78	5		15300						N13 E41				R	120	1	HSX
78	5	17	15300	N20 E33	188	5000	3.0	20035	N12 E26	193	(AP)	4	B	70	1	HSX
78	5	18	15300	N20 E20	188	5300	3.0	20035	N12 E14	192	(AP)	5	B	80	1	HSX
78	5	19	15300	N20 E07	188	5300	3.0	20035	N12 E01	193	(AP)	5	B	80	1	HSX
78	5		15300					20041	N18 E21	173	(AF)	2	B	20	3	BXI
78	5	20	15300	N20 W07	189	5300	3.0	20035	N12 W13	193	(AP)	5	B	80	1	HSX
78	5	21	15300	N20 W20	187	5300	3.5	20035	N12 W26	193	(AP)	5	B	50	1	HSX
78	5	22	15300	N20 W30	185	4900	3.0	20035	N12 W39	192	(AP)	3	B	70	1	HSX
78	5	23	15300	N20 W42	183	4200	3.0		N11 W50				B	70	1	HSX
78	5	24	15300	N20 W55	184	3800	3.0		N12 W66				M	30	1	HSX
78	5	25	15300	N20 W70	186	3500	2.0	20035	N12 W81	196	(AP)	3	R	40	1	HSX
78	5	26	15300	N20 W82	185	2000	2.0									

MCMATH REGION 15324 CMP DATE 21.1

			CALCIUM		PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	27	15324	S19 W85	174	300	3.0									

MCMATH REGION 15304 CMP DATE 21.2

			CALCIUM		PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	16	15304	S17 E65	169	300	2.5	20037	S17 E58	171	X	1	R	10	2	BXO
78	5	17	15304	S17 E53	168	300	3.0									
78	5	18	15304	S17 E37	171	300	3.0									
78	5	19	15304	S17 E23	172	300	2.5									
78	5	20	15304	S17 E10	172	300	2.0									
78	5	21	15304	S18 W04	171	400	1.0									

MCMATH REGION 15312 CMP DATE 21.2

			CALCIUM		PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	21	15312	N37 W05	172	100	2.5									
78	5	22	15312	N37 W15	170	200	1.0									

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15317 CMP DATE 22.0

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	24	15317	S01 W33	162	200	2.0									
78	5	25	15317	S01 W45	161	100	1.0									

MCMATH REGION 15309 CMP DATE 22.2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	19	15309	S14 E37	158	300	1.5									
78	5	20	15309	S14 E24	158	200	1.0									
78	5	21	15309	S15 E08	159	200	1.5									

MCMATH REGION 15323 CMP DATE 22.2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	25	15323	N18 W44	160	100	1.5									
78	5	26	15323	N18 W59	162	200	1.5									

MCMATH REGION 15325 CMP DATE 22.7

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	27	15325	N18 W63	152	100	1.0									

MCMATH REGION 15313 CMP DATE 22.8

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	21	15313	S33 E16	151	300	3.0	20043	S32 E15	152	(B)	2	B	10	2	BXO
78	5	22	15313	S32 E04	151	200	3.0									
78	5	23	15313	S32 W10	151	100	2.5									

MCMATH REGION 15318 CMP DATE 23.5

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	24	15318	S15 W14	143	200	2.5		S16 W20				H	10	3	BXO
78	5	25	15318	S15 W26	142	400	2.0		S16 W26				R	10	5	BXO
78	5	26	15318	S15 W40	143	300	2.0									
78	5	27	15318	S15 W52	141	400	2.0									
78	5	28	15318	S15 W66	142	300	1.0									

MCMATH REGION 15307 CMP DATE 24.3 RETURN OF REGION 15265 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	18	15307	N26 E78	130	200	1.5									
78	5	19	15307	N27 E64	131	100	1.0									

MCMATH REGION 15320 CMP DATE 24.3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	25	15320	N28 W16	132	200	2.0	20045	N28 W19	134	(AP)	1	R	10	5	BXO
78	5		15320					20046	N28 W05	120	X	1				
78	5	26	15320	N28 W29	132	300	2.0									
78	5	27	15320	N28 W42	131	200	1.5									
78	5	28	15320	N28 W56	132	200	1.0									
78	5	29	15320	N28 W70	133	200	1.0									
78	5	30	15320	N29 W87	137	300	1.0									

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15305 CMP DATE 24.4 RETURN OF REGION 15252 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	17	15305	S30 E90	131	1800	2.5	20038	S30 E80	139	(AP)	2	B	60	1	HSX
78	5	18	15305	S31 E80	128	2000	2.5	20038	S30 E67	139	(AP)	4	B	70	3	HSX
78	5	19	15305	S30 E65	130	3000	3.0	20038	S29 E54	140	(AP)	4	B	60	2	HSX
78	5	20	15305	S30 E51	131	3000	3.0	20038	S30 E40	140	(Y)	3	B	50	4	CSO
78	5	21	15305	S31 E35	132	3000	3.0	20038	S30 E28	139	(AP)	3	B	50	3	HSX
78	5	22	15305	S30 E23	132	3000	3.0	20038	S29 E15	138	(AP)	3	B	80	4	CSO
78	5	23	15305	S30 E11	130	2800	2.5		S28 E03				B	70	1	HSX
78	5	24	15305	S30 W03	132	2600	3.0									
78	5	25	15305	S30 W12	128	2600	2.5	20038	S29 W22	137	(AP)	3	R	20	8	BXO
78	5		15305					20047	S33 W06	121	(AF)	2				
78	5	26	15305	S30 W25	128	2700	2.5	20038	S29 W36	138	(AP)	3	B	10	2	AXX
78	5	27	15305	S30 W39	128	2700	2.5		S31 W30				B	10	2	AXX
78	5	28	15305	S30 W52	128	2700	2.5									
78	5	29	15305	S30 W65	128	2000	2.5									
78	5	30	15305	S31 W78	128	900	2.5									
78	5	31	15305	S32 W90	127	500	1.0									

MCMATH REGION 15331 CMP DATE 25.6

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	29	15331	S22 W52	115	600	3.5	20055	S23 W55	117	(BP)	3	B	50	6	BXI
78	5	30	15331	S23 W66	116	1200	3.5	20055	S23 W69	117	(B)	3	R	50	9	BXO
78	5	31	15331	S24 W80	117	1500	3.0	20055	S23 W80	115	B	1	R	50	11	DRI
78	6	01	15331	S24 W90		100	1.0									

MCMATH REGION 15310 CMP DATE 25.8

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	19	15310	S17 E88	107	300	1.0									
78	5	20	15310	S17 E73	109	500	2.5	10042	S19 E70	110	(AF)	1	B	0	2	AXX
78	5	21	15310	S18 E58	109	700	3.0	20042	S18 E55	112	(B)	2	B	0	4	BXO
78	5	22	15310	S18 E43	112	1000	3.0	20042	S18 E39	114	(B)	3	B	20	3	BXO
78	5	23	15310	S18 E30	111	700	2.5		S17 E23				B	10	2	AXX
78	5	24	15310	S18 E17	112	700	2.0		S19 E11				H	20	4	BXO
78	5	25	15310	S18 E04	112	700	2.5		S23 W04				R	10	1	AXX
78	5	26	15310	S18 W10	113	600	2.5									
78	5	27	15310	S18 W23	112	600	2.5									
78	5	28	15310	S18 W35	111	600	2.5									
78	5	29	15310	S18 W48	111	600	2.0									
78	5	30	15310	S18 W63	113	600	2.0									
78	5	31	15310	S18 W77	114	600	1.0									

MCMATH REGION 15315 CMP DATE 26.9

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	22	15315	S25 E59	96	100	1.5									

MCMATH REGION 15334 CMP DATE 27.5

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	30	15334	N35 W39	89	200	3.0									
78	5	31	15334	N35 W53	90	600	2.5	20059	N33 W40	75	(B)	3	R	30	3	BXO
78	6	01	15334	N35 W65		600	2.0									
78	6	02	15334	N34 W80		400	2.0									

MCMATH REGION 15327 CMP DATE 27.7

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	27	15327	S16 E02	87	100	1.5	20053	S17 W01	89	(AP)	2	B	10	3	AXX
78	5	28	15327	S16 W11	87	100	1.5									

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15321 CMP DATE 28.3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	25	15321	S17 E35	81	100	1.0									
78	5	26	15321	S17 E23	80	200	2.0	20052	S16 E22	80	(B)	2	B	10	2	BXO
78	5	27	15321	S16 E10	79	400	2.5	20052	S17 E08	80	(BF)	3	B	20	12	CRI
78	5	28	15321	S17 W03	79	400	3.0	20052	S17 W05	80	(B)	3	B	20	9	CRO
78	5	29	15321	S17 W16	79	600	3.0	20052	S17 W18	80	(BP)	2	B	60	12	BXI
78	5	30	15321	S17 W30	80	500	2.5	20052	S17 W34	82	(BF)	3	R	30	10	BXO
78	5	31	15321	S17 W44	81	800	3.0	20052	S15 W47	82	(BP)	4	R	60	16	CRI
78	6	01	15321	S16 W58		1000	3.5	20052	S16 W62		(B)	4	B	160	21	C
78	6	02	15321	S16 W72		1000	3.0	20052	S17 W75		(BP)	3	B	130	4	C
78	6	03	15321	S16 W85		600	3.5	20052	S17 W86		(AF)	2				

MCMATH REGION 15340 CMP DATE 28.3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	6	03	15340	S26 W67		100	1.5									
78	6	04	15340	S26 W78		100	1.0									

MCMATH REGION 15314 CMP DATE 28.4 RETURN OF REGION 15266 ROTATION 2 AND 5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	21	15314	N18 E88	79	1500	3.5	20044	N18 E80	87	(BP)	3	B	70	2	CSO
78	5	22	15314	N18 E75	80	5100	3.5	20044	N18 E67	86	(BP)	4	B	480	5	DKC
78	5	23	15314	N18 E60	81	8200	3.5		N18 E67				B	70	7	CSO
78	5	24	15314	N18 E50	79	10000	3.5		N17 E40				M	640	37	FKC
78	5		15314						N25 E56				M	120	1	HSX
78	5	25	15314	N18 E37	79	11000	3.5	20044	N18 E32	83	(D)	5	R	760	57	FKC
78	5		15314					20048	N24 E21	94	(AP)	2				
78	5		15314					20049	N26 E49	66	(AP)	5	R	100	3	CSO
78	5	26	15314	N18 E24	79	11300	3.5	20044	N18 E18	84	(D)	5	B	650	52	FKI
78	5		15314					20048	N23 E08	94	(B)	3	B	20	7	BXI
78	5		15314					20049	N27 E36	66	(AP)	5	B	100	5	CSO
78	5	27	15314	N18 E12	77	12000	3.5	20044	N18 E06	82	(D)	5	B	580	50	FKI
78	5		15314					20048	N23 W05	93	(BY)	4	B	70	21	DAI
78	5		15314					20049	N27 E23	65	(Y)	5	B	10	9	CSO
78	5	28	15314	N18 W02	78	10700	3.5	20044	N18 W07	82	(D)	5	B	480	40	FKI
78	5		15314					20048	N23 W18	93	(BY)	4	B	100	19	DAI
78	5		15314					20049	N27 E09	66	(BF)	6	B	80	8	CSO
78	5	29	15314	N18 W15	78	10300	3.5	20044	N18 W24	86	(D)	5	B	500	35	FKI
78	5		15314					20048	N23 W32	94	(B)	4	B	220	16	DAI
78	5		15314					20049	N26 W04	66	(BF)	5	B	80	7	CSO
78	5	30	15314	N18 W30	80	11500	3.5	20044	N17 W36	84	(Y)	5	R	550	45	FKC
78	5		15314					20048	N23 W45	93	(B)	4	R	150	7	DAO
78	5		15314					20049	N25 W17	65	(BF)	5	R	130	2	CSO
78	5	31	15314	N18 W42	79	11400	5.0	20044	N17 W50	85	(Y)	5	R	360	24	FKI
78	5		15314					20048	N23 W59	94	(B)	4	R	110	7	DAO
78	5		15314					20049	N24 W29	64	(AP)	5	R	90	1	HSX
78	6	01	15314	N19 W55		10500	3.5	20044	N17 W65		(Y)	5	B	260	12	D
78	6	01	15314					20048	N22 W72		(B)	4				
78	6	01	15314					20049	N25 W42		(Y)	5				
78	6	02	15314	N18 W68		9500	3.0	20044	N17 W79		(BP)	3	B	260	6	B
78	6	02	15314					20049	N24 W55		(BP)	5				
78	6	03	15314	N18 W80		6500	3.0	20049	N25 W62		(AP)	4				
78	6	04	15314	N19 W85		4500	1.5	20049	N25 W83		(AP)	3	B	50	1	H

MCMATH REGION 15316 CMP DATE 29.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	6	01	15316	N27 W39		1600	2.0						B	140	19	C
78	6	02	15316	N28 W53		1300	2.0						B	150	11	C
78	6	03	15316	N28 W66		1500	2.5						B	120	3	C
78	6	04	15316	N27 W79		1200	2.5									

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15335 CMP DATE 29.6

			CALCIUM			PLAGE DATA			SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	30	15335	S17 W12	62	300	2.0	20057	S17 W14	62	(B)	4	R	40	12	BXO
78	5	31	15335	S17 W26	63	700	2.5	20057	S17 W27	62	(BP)	3	R	70	12	DRO
78	6	01	15335	S17 W39		900	2.5	20057	S17 W41		(B)	3	B	40	20	B
78	6	02	15335	S17 W52		900	3.0	20057	S17 W55		(B)	3	B	20	9	B
78	6	03	15335	S17 W65		1500	2.5	20057	S16 W68		(AF)	3	B	60	8	B
78	6	04	15335	S17 W78		1500	3.0									
78	6	05	15343	S16 W66		200	1.5									

MCMATH REGION 15332 CMP DATE 30.4

			CALCIUM			PLAGE DATA			SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	29	15332	S18 E12	51	300	1.5									
78	5	30	15332	S18 W03	53	300	1.5	20058	S19 W04	52	(AP)	3	R	20	10	BXO
78	5	31	15332	S19 W12	49	300	1.5	20060	S20 W14	49	(AF)	3	R	10	2	AXX

MCMATH REGION 15328 CMP DATE 31.0

			CALCIUM			PLAGE DATA			SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	28	15328	S10 E33	43	200	1.0		S08 E33				B	10	1	AXX
78	5	29	15328	S10 E20	43	200	1.0									
78	6	01	15332	S19 W26		400	2.5	20060	S18 W20		(B)	3	B	30	11	B
78	6	02	15332	S23 W40		500	2.0	20060	S18 W43		(B)	3	B	10	5	B
78	6	03	15332	S18 W53		700	2.0						B	10	1	A
78	6	04	15332	S18 W65		500	2.0									
78	6	05	15332	S18 W78		500	1.5									

MCMATH REGION 15319 CMP DATE 31.3

			CALCIUM			PLAGE DATA			SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	24	15319	N19 E87	42	600	1.0									
78	5	25	15319	N20 E76	40	1800	3.0	20050	N18 E75	40	(AP)	2				
78	5		15319					20051	N22 E79	36	(B)	2	R	10	4	BXO
78	5	26	15319	N21 E64	39	2500	4.0	20050	N20 E60	42	(AP)	3	B	130	9	CAI
78	5		15319					20051	N26 E69	33	(AP)	2	B	10	4	BXO
78	5	27	15319	N21 E52	37	3100	3.0	20050	N23 E49	39	(BF)	4	B	160	21	CKI
78	5	28	15319	N21 E38	38	3100	3.0	20050	N22 E37	38	(BP)	3	B	90	18	DRO
78	5	29	15319	N21 E25	38	2800	3.0	20050	N21 E22	40	(BY)	3	B	60	11	CRI
78	5	30	15319	N21 E10	40	3200	3.0	20050	N20 E09	39	(AP)	3	R	110	36	DRI
78	5	31	15319	N21 W02	39	3000	3.0	20050	N21 W04	39	(Y)	4	R	140	34	DRI
78	6	01	15319	N21 W15		3300	3.5	20050	N21 W16		(B)	4	B	100	55	D
78	6	02	15319	N21 W29		3000	3.5	20050	N21 W30		(B)	4	B	270	26	D
78	6	03	15319	N22 W42		3200	3.5	20050	N22 W43		(BP)	3	B	250	30	E
78	6	04	15319	N22 W55		3500	3.5	20050	N22 W58		(B)	4	B	100	6	D
78	6	05	15319	N23 W69		3500	3.5	20050	N23 W72		(B)	3	B	100	16	D
78	6	06	15319	N23 W82		2800	3.5	20050	N25 W80		(AF)	2	B	40	7	C

MCMATH REGION 15343 CMP DATE 31.3

			CALCIUM			PLAGE DATA			SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	6	04	15343	S16 W55		200	2.0									

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on May 5 and 8, 1978.
No sunspot observations were made at Mt. Wilson on May 15, 23, and 24, 1978.

DAILY CALCIUM PLAGE INDEX

MAY 1978

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
78	5	1	46.8	78	5	11	30.1	78	5	21	42.5
78	5	2	50.2	78	5	12	33.6	78	5	22	38.5
78	5	3	50.7	78	5	13	37.8	78	5	23	35.1
78	5	4	47.2	78	5	14	37.9	78	5	24	37.5
78	5	5	*	78	5	15	37.9	78	5	25	40.8
78	5	6	36.6	78	5	16	42.5	78	5	26	46.9
78	5	7	33.6	78	5	17	42.4	78	5	27	52.5
78	5	8	*	78	5	18	42.0	78	5	28	50.0
78	5	9	31.1	78	5	19	42.7	78	5	29	48.5
78	5	10	31.0	78	5	20	40.8	78	5	30	52.2
								78	5	31	58.1

* NO OBSERVATIONS

SUDDEN IONOSPHERIC DISTURBANCES

MAY 1978

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
01	1115	1143	1126	1	3			2					1109	15266
01	1725	1815	1733	1	5	1			1		13		1727E	15266
01	1916	2258	2008	2+	5	3	1	1	2		13		1910E	15266
01	1951	2103	1958	1-	3			1			4		1955	15252
02	0057	0345D	0144	2	5	1		1	1		1		0048	15266
02	0346	0407	0352	1-	5	1		1	1		1		0347E	15266
02	0612	0806D	0618	1+	5			2	3		1		0616E	15280
02	0642	0644D	0644	1-	3			2	2				0639E	15266
02	0811	0900	0825	1	3	1		1			3		NF	
02	1148	1200	1151	1	5			3	2		1		1130	15252
02	1218	1305	1228	1-	5	2		3	2		2		1200	15266
02	1304	1316	1307	1-	1			1					1307	15252
02	1332	1359	1334	1-	3	1					1		1330	15266
02	1437	1515	1442	1-	1				1		1		1432	15252
02	2200	2243	2206	1-	1				1				2205	15266
02	2306	2342	2320	1-	1				1				2314E	15266
03	0123	0208	0130	1-	1				1				0122	15280
03	0403	0454	0410	1-	1				1				*	
03	1137	1345	1150	1-	5	1		5	4		2		1126	15252
03	1406	1523	1424	1-	1				1		1		1355	15266
03	1657	1815	1710	1	5	3		5	3		13		1655	15266
03	1815	1915	1819	1-	1	1							1815	15266
03	2020	2105	2027	1-	5	1			1		5		2020	15266
04	0142E	0205D	0155	1-	5	1		1	1		1		0150	15266
04	0255E	0422D	0302	1	5	1		1	1		1		0259	15266
04	0638	0806	0700	1	3			1	1				0638	15266
04	0955	1040	1007	1	5	1		3	4		1		0952	15266
04	1239	1246D	1246	1-	1				1		1		*	
04	1308	1350	1320	1+	5	3		5	3		2		*	
04	1400	1525	1425	1-	3	1			1		1		*	
04	1543	1615	1547	1-	1				1		1		*	
04	1620	1715	1626	1-	1				1		1		*	
05	0008	0108	0014	1-	1				1				*	
05	1027	1154	1034	1+	5	3		3	3		2		1028	15266
05	1538	1555	1543	1-	5			4	2		3		1537	15266
05	1647	1725	1654	1-	3			2	1		1		*	
05	1759	1857	1805	1-	5				1		4		*	
05	1915	1938	1921	1-	1	1							*	
05	2113	0019	2128	1	1				1				*	
05	2156	2301	2216	1-	3			1	1		1		*	
06	0133	0307	0216	1-	1				1				NF	
06	0409	0558	0437	1-	1				1				*	
06	0930	0945	0934	1-	5	1			3		2		*	
06	1142	1230	1158	1-	3			1			7		1140E	15266
06	1255	1330	1303	1-	5						8		1255	15266
06	1543	1610	1555	1	3			1			3		1535	15266
06	1726	1840	1734	1	5						5		NF	
06	1900	1936	1907	1-	1	1							*	
06	2004	2151D	2032	2+	5	3	1	2	1		8		*	
06	2142	2300D	2158	1	1				1				*	
06	2220E	2252	2234	1-	1				1				*	
07	0323	0625D	0422	3-	3	2			1		1		0336E	15266
07	0625E	0753	0633	1+	5	1		2	2				0625	X-RAY
07	0834	0842D	0842	1	5	2		3	2				0835	15266
07	0856	0900D	0900	1	3	1		2	1				0854	X-RAY
07	1113	1220	1130	1+	5	2	1	4	3		2		1111	X-RAY
07	1236	1240D	1240	1-	5			2	2		1		1237	15266
07	1316	1410	1325	1-	3			1	1		1		1318	15266
07	1435	1520	1436	1-	5	1		3	2		9		1425	15266
07	1513	1517D	1517	1-	1				1		1		1512	15266
07	1553	1655	1606	2	5	5	1	7	3		13		1544	15266
07	1640	1650	1651	1-	5	3					3		NF	
07	1703	1900	1711	1-	5	1	2		2		9		1702	X-RAY
07	1904	1930U	1910	1-	3		1				1		1902	X-RAY

SUDDEN IONOSPHERIC DISTURBANCES

MAY 1978

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
08	0643	0700	0650	1+	5	2		6	3		1		0645	X-RAY
08	1110	1127D	1127	1	5	2		1	2		5		NF	
08	1205	1530	1242	2	5	4	1	4	3		2		1212	15266
08	1511	1524	1518	1-	1			1	1				*	
08	1648	1740	1651	1-	3	1					5		*	
09	0115	0211D	0144	1-	1				1				*	
09	0408E	0536	0414	2	5	1		1	1		1		0409	X-RAY
09	0708	0755	0727	2	3	2	1		2				NF	
09	1208	1348	1231	1+	5	2	1	4	3		2		1201	X-RAY
09	1425	1650	1445	3	5	6	2	5	2		12		1442E	15266
10	0739	0932	0806	1-	1				1				0734	X-RAY
10	1240	1302	1251	1-	1			1					*	
10	2210	2235	2212	1-	1	1							2200	X-RAY
11	0251	0353	0315	1-	1				1				0247	X-RAY
12	0508	0535	0516	1-	1				1				0507	X-RAY
12	1232U	1315	1233	1-	1			1					*	
12	1529	1557	1536	1-	1			2					*	
13	0740	0810	0753	1	5	2		2	3		1		0805	15294
14	1352	1420	1406	1	5	1	1	2	2		9		1345	X-RAY
16	0447	0542	0450	1-	1				1				0444	X-RAY
16	1610	1721	1637	1-	5	1		2	1		9		1626E	15291
16	1750	1819	1801	1-	1			1					1758	15298
17	0355	0456	0400	1-	1				1				0355	X-RAY
17	1235	1415	1245	1-	5	3	1	4	3		4		1233	15292
17	1510	1700	1517	2+	5	5	1	5	3		13		1504	15301
18	0218	0320	0230	1-	1				1				0215	X-RAY
18	0622	0712	0636	1-	1				1				0622	X-RAY
18	1158	1330	1208	1-	5	2	1	1	3		2		1159E	15303
18	1434	1452	1439	1-	1				1				*	
19	1850	1920	1900	1-	1	1							1842	15296
19	2107	2211	2116	1-	5	2	1	1	1		10		*	
19	2310	2349	2322	1-	5	2			1		10		NF	
20	0023	0135D	0052	1-	3	2			1				*	
20	0132	0231D	0139	1-	3	1			1				0132	X-RAY
20	0231E	0332	0237	1-	1				1				0226	15296
20	1237	1320	1254	1-	1				1		1		*	
20	1833	1925	1843	1	5	1		1			10		1832	X-RAY
20	2238	2322D	2245	1-	1				1				2238	X-RAY
21	0037	0102D	0046	1-	1				1				0036	X-RAY
21	0432	0530D	0441	1-	1				1				0430	X-RAY
21	0538E	0807	0551	1+	3	1		1	2		1		NF	
21	1700	1820	1720	1	3						6		NF	
21	1717	1743	1720	1	1	1							1716	15314
21	2000	2128	2013	1	1					1			*	
21	2044	2136	2100	1-	1					1			2044	X-RAY
21	2230	2250D	2250	1	5						8		*	
21	2302	0042	2331	1-	5			1		1	3		*	
21	2345	0032	2350	1-	5	1		1			5		2349	X-RAY
22	0201	0313	0209	1	3	1			1		1		0201	X-RAY
22	0601E	0706D	0607	1-	1				1				*	
22	0706E	0908	0716	1-	1				1				0707	X-RAY
22	1502	1625	1522	1-	5		1	1	1		12		1459	15314
22	1532	1606	1541	1-	3						3		1522	15314
22	1625	1700	1631	1-	5		1	1	1		9		1625	15301
22	2123	2140	2130	1-	1	1							*	
23	0016	0330	0034	2	5	1		1	1		3		0015	15314
23	1952	2045	2006	1-	3						4		1949	X-RAY

SUDDEN IONOSPHERIC DISTURBANCES

MAY 1978

DAY	UNIVERSAL TIME				WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE							KNOWN FLARE	McMATH REGION
	START	END	MAX	IMP		SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD		
24	0202	0247	0216	1-	1				1				*	
24	1721	1728D	1728	1-	1	1							*	
24	1755	1910	1804	1-	5	2		1	1		12		1750	X-RAY
24	1907	2052	1928	1	5	2	1	1	2		11		1901	15314
24	2243	2317	2251	1-	1				1				2241	X-RAY
25	0334	0436	0346	1-	1				1				0332	X-RAY
25	0538	0738	0621	1-	1				1				0537	X-RAY
25	0846	1002	0858	1-	1				1				*	
25	1250	1329	1310	1	1			1					*	
26	0043	0200	0055	1-	1				1				0041	15314
26	0548	1014	0651	2	1				1				*	
26	0605	0858	0650	1-	3			1	1				*	
26	1236	1255D	1255	1-	1				1		1		1241	15319
26	1330	1455	1343	1-	1				1		1		1323	15319
26	1604	1625	1609	1-	3	1		2					1604	15319
26	1748	1945	1757	2	5	5	2	6	3		12		1744E	15319
27	0320	0346	0325	1-	1			1					0318	X-RAY
27	0551	0724	0556	1-	5			2	2				NF	
27	0810	1004D	0816	1-	5	3		2	3		1		0808	X-RAY
27	1005	1150	1020	1	5	3	1	3	4		2		1013E	15319
27	1116	1125	1119	1-	1			1	1				*	
27	1620	1743	1632	1-	5	4		3	2		10		1620	15319
28	0718	0900	0732	1	5	3		2	3		1		0716E	15314
28	1036	1205	1117	1-	5	2	1	3	3		3		1044E	15314
28	1316	1455	1346	1+	5	6	1	3	3		12		1310	15314
28	1458	1715	1505	3	5	7	2	6	3		13		1451	15314
28	2034	2138	2042	1-	1				1				2033	X-RAY
29	0016	0054	0023	1-	1				1				0014	X-RAY
29	0125	0202	0134	1-	1				1				0124	X-RAY
29	0659	0739	0704	1-	1				1				0655	X-RAY
29	1045	1250	1115	1-	5	1		1	3		1		1040	15314
29	1515	1617	1520	1-	1				1				1512	15314
29	1759	1915	1802	1	5	4	2	3	3		12		1740E	15314
29	2112	2240	2147	1-	1				1				*	
29	2144	2237	2151	1-	1				1				*	
30	0407	0530	0420	1-	1				1				0411E	15314
30	0551E	1056	0724	1-	1				1				*	
30	0615	0929	0728	1	5			2	2				0620	15314
30	0650	0812	0724	1-	1				1				0655E	15314
30	0712	0925	0724	2	5	4	1	7	2		2		0716	15314
30	1000	1040	1009	1-	3			1	1				1001	15314
30	1525	1630	1530	1-	5	6	1	4	2		12		1523	15314
30	1730	1805	1737	1	1	1							1737	15319
30	1925	2118	1933	2	5	3	1	1	1		11		1727E	15314
30	2237	2241D	2241	1	1		1						*	
30	2254	2335	2307	1	1	1							*	
31	0156	0230	0209	1-	1				1				0156	X-RAY
31	0732	1019D	0739	1	5	2		5	2		1		0733E	15314
31	1016	1430	1058	2+	5	5	1	4	3		1		1014	15314
31	1135E	1230	1154	1	1				1				1130	15335

SUDDEN IONOSPHERIC DISTURBANCES

MAY 1978

PERIODS OF NO OBSERVATIONS:

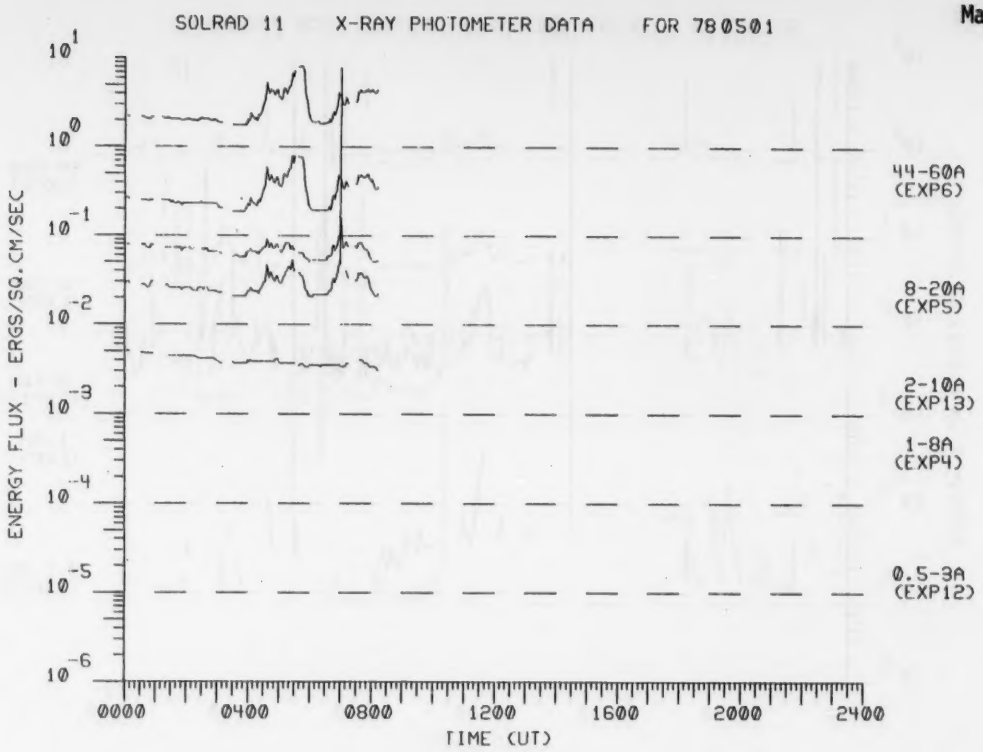
DATE	TIME (UT) and STATION
01-31	0000-2400 A30, 0000-2400 A40
01-20	0000-2400 A46
01	1828-1837 TM
02	1040-1355 UM (16 kHz), 2028-2102 UM (13 kHz)
04-13	0000-2400 A34
06	0737-2122 TM
09	1011-1340 UM (16 kHz), 1704-1900 UM (16 kHz), 1704-1900 UM (13 kHz)
10	0715-0750 UM (13 kHz)
16	1001-1330 UM (16 kHz)
17	0714-0758 UM (13 kHz)
19	0000-2400 TN
20-31	1600-2400 A5
21	0000-2400 TN
22	1544-1557 TM
29	1605-1940 UM (13 kHz)
30	2054-2112 TM

STATIONS REPORTING FOR MAY 1978

AAVSO (A1, A5, A19, A21, A26, A28, A30, A31, A34, A37, A40, A45, A46) (SES) (A1, A31) (SEA) (A31) (SWF)
BEARLY (BY) (SWF)
CHILWORTH (CL) (SCNA)
DARMSTADT (DA) (SWF)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
JULIUSRUH (JH) (SWF)
KUHLUNGSBORN (KU) (SES, SPA)
MC MATH (MC) (SWF, SCNA)
NEW JERSEY (NJ) (SES)
PANSKA VES (PU) (SEA,SES)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
ST CLOUD (SC) (SES)
TORINO (TN) (SPA)
UPICE (UI) (SEA)
VSETIN (VS) (SEA)

SIDs BY McMATH REGION

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
REGION																															
15252	1	3	1																												
15266	3	7	4	4	2	3	7	1																							
15280		1	1																												
15291																1															
15292																	1														
15294													1																		
15296																			1	1											
15298																1															
15301																	1					1									
15303																		1													
15314																					1	2	1	1		1		4	3	7	2
15319																										4	2			1	
15335																															1
X-RAY							5	1	2	2	1	2		1		1	1	2		3	4	2	1	2	2		2	1	3		1
UNKNOWN		1				2	1	1	1										1		2						1				
NO FP			1	5	6	6		2	1	1		4						1	1	2	3	2		2	2	2	1		2	3	


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780501
ENERGY FLUX - ERGS/SQ.CM/SEC
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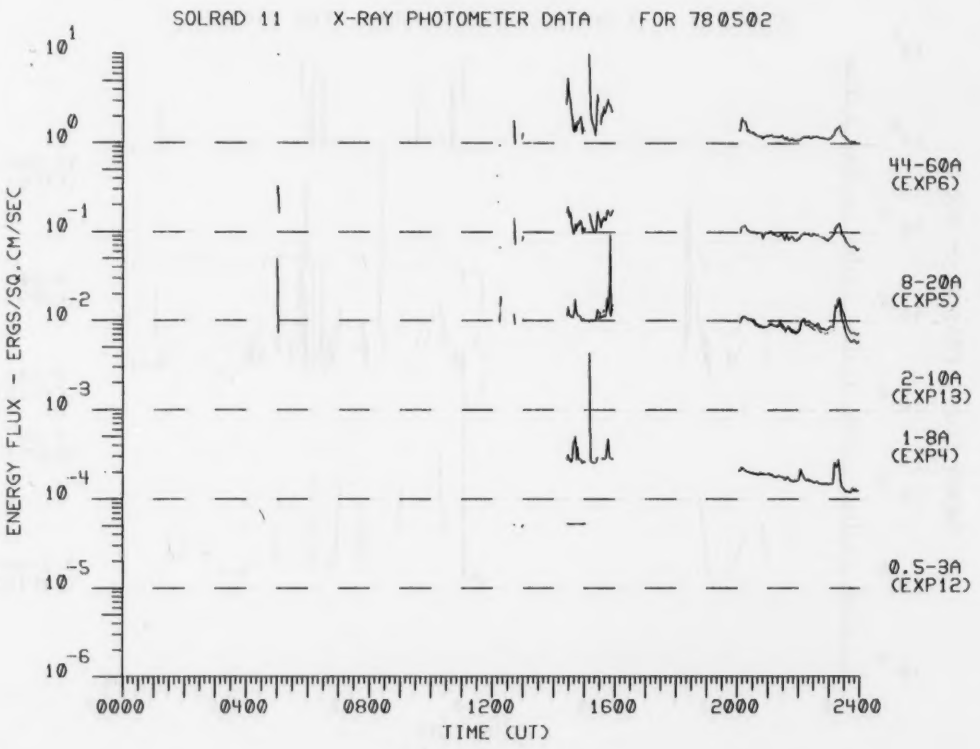
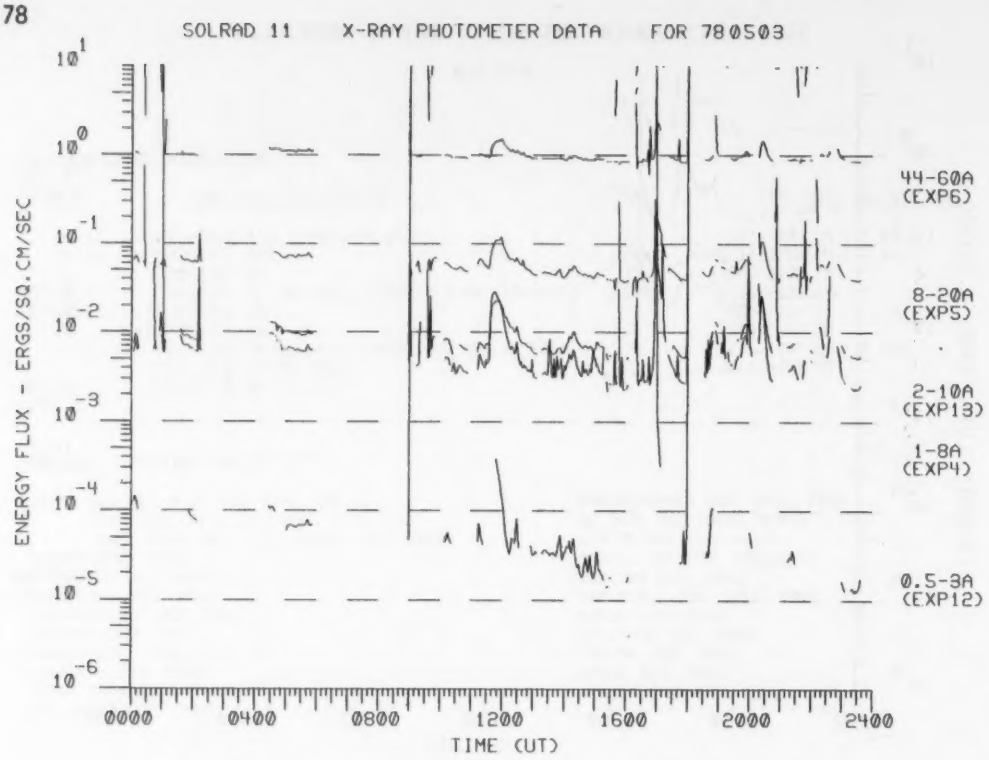
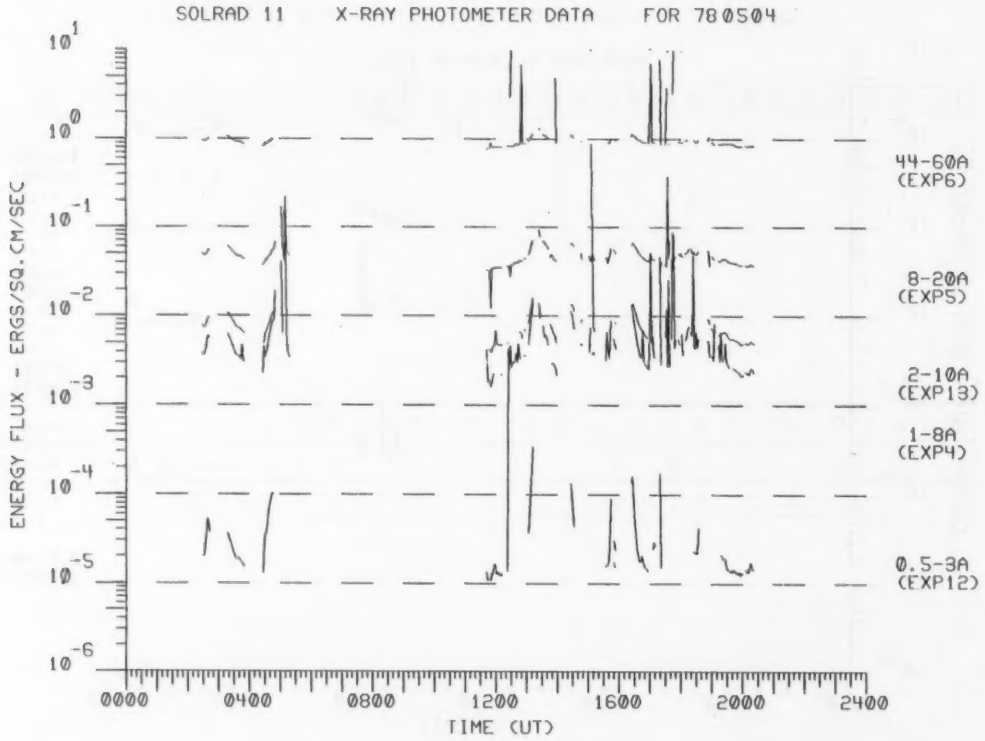
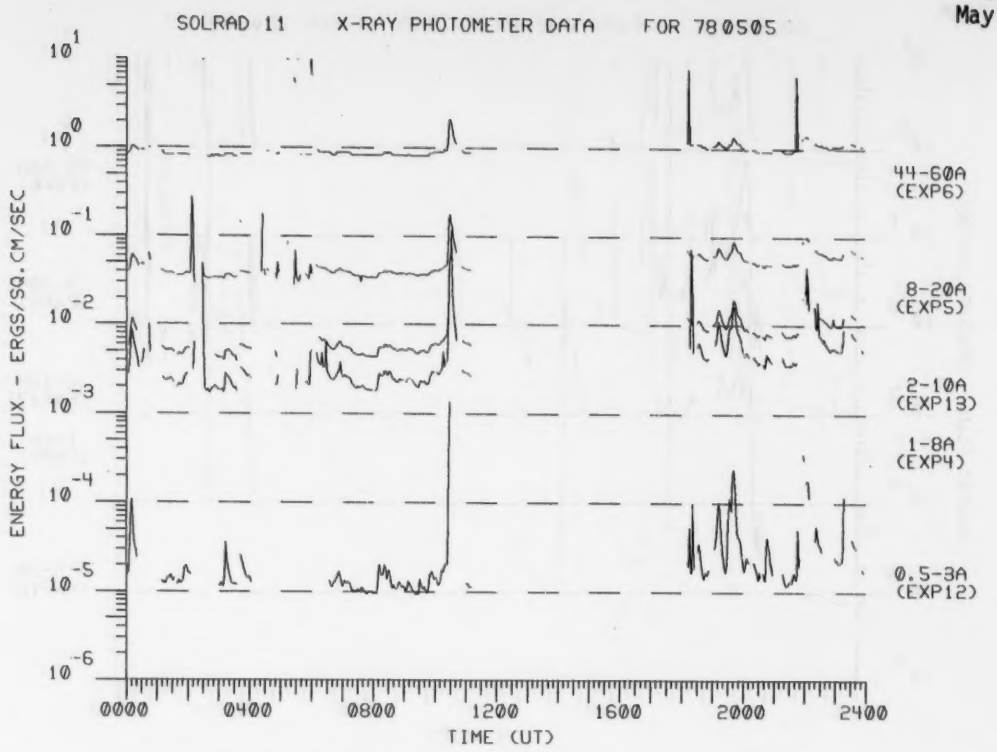
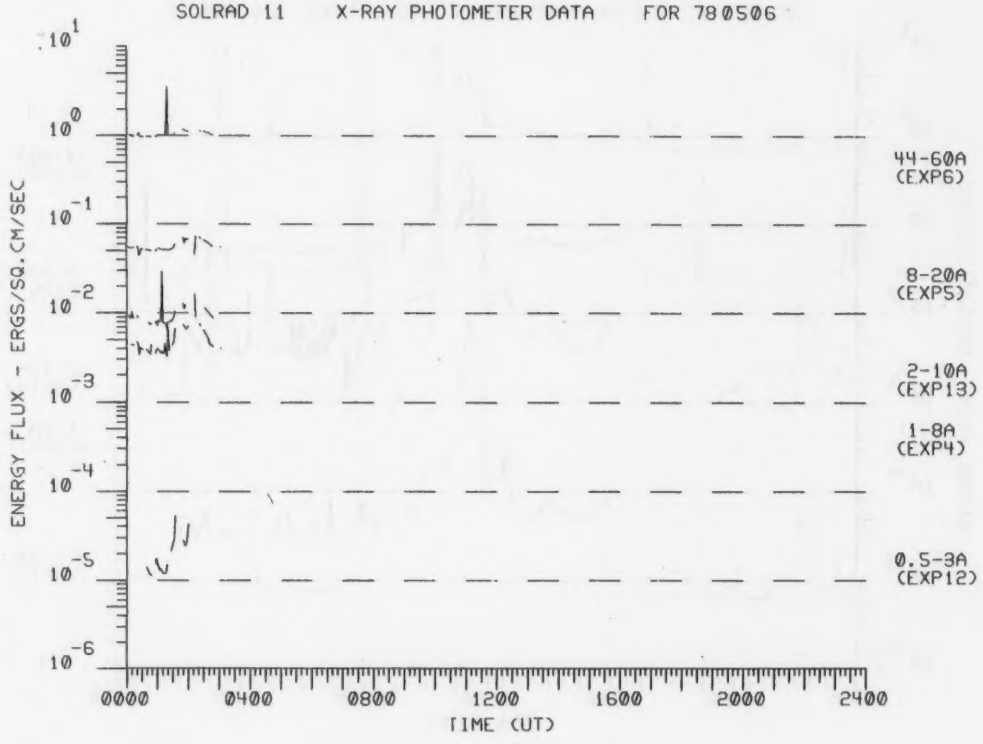
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

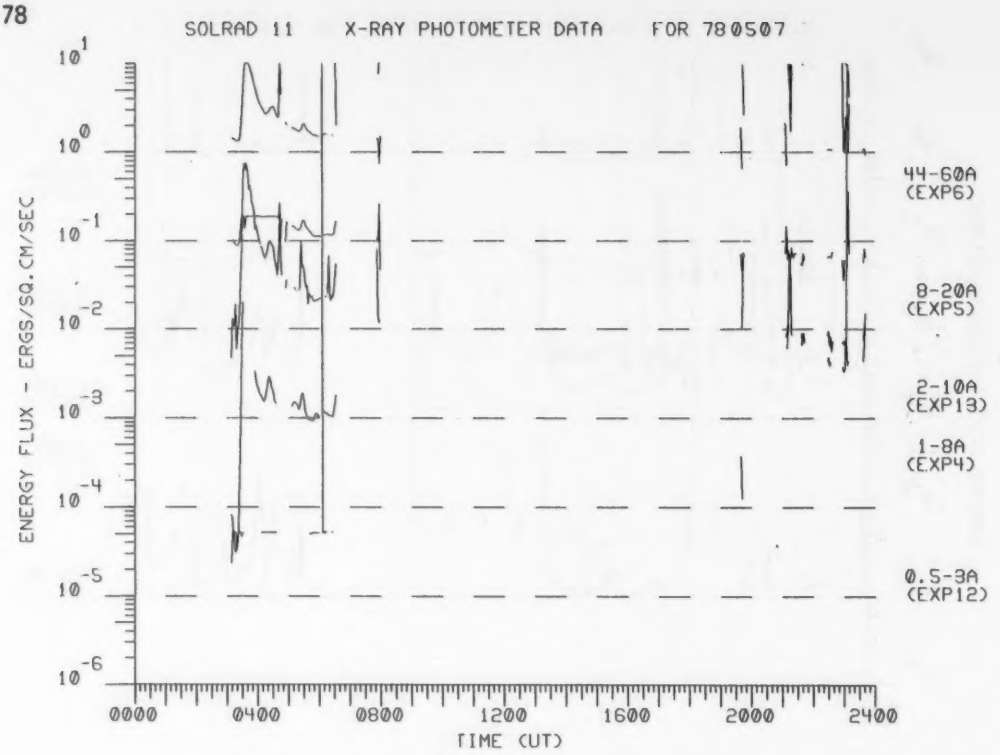

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780502
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

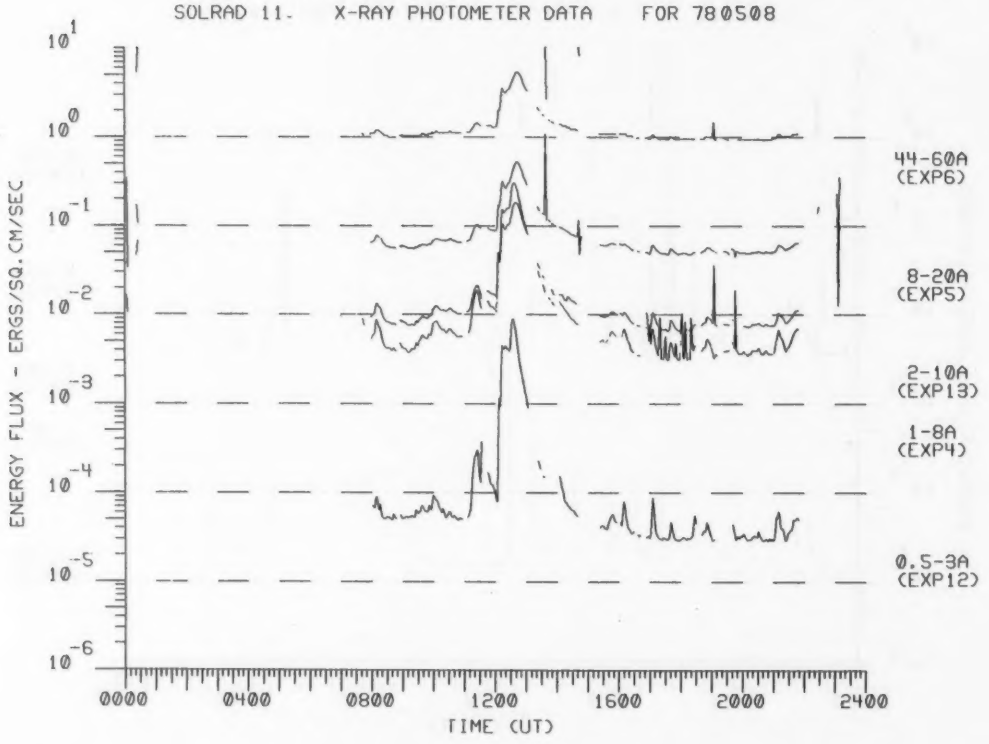

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780503
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

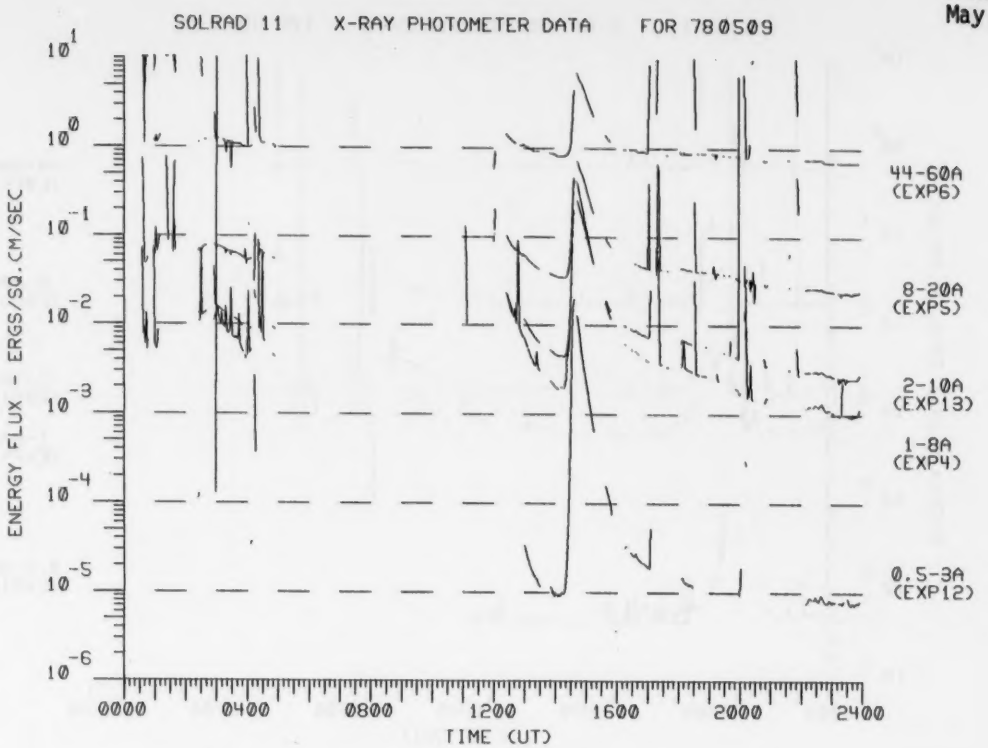

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780504
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

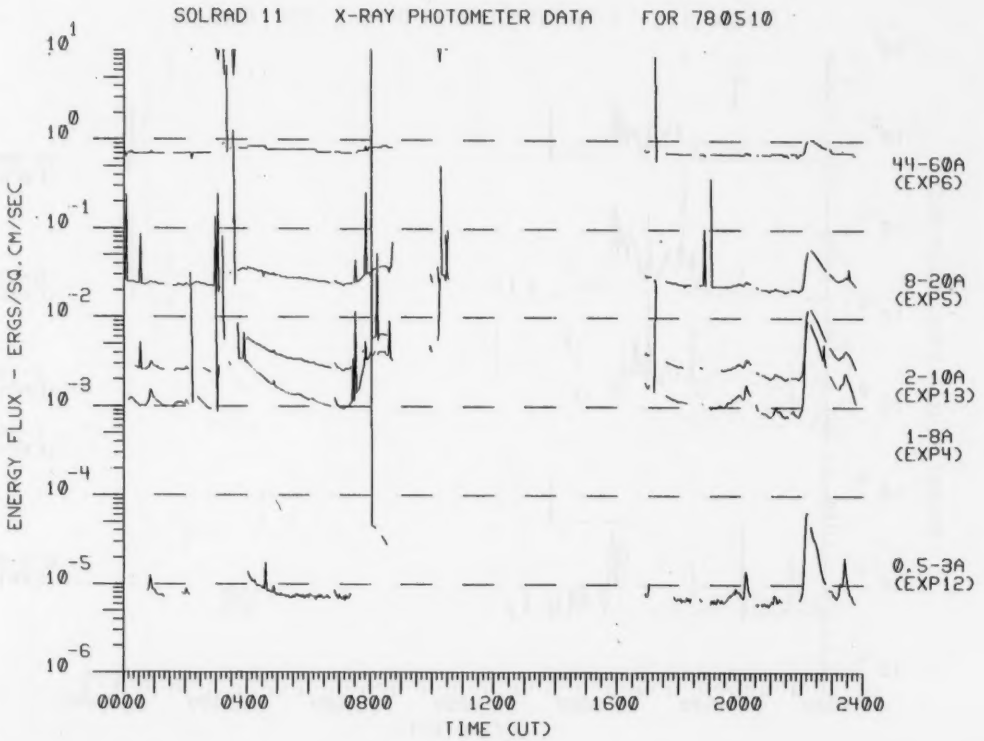

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780505
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

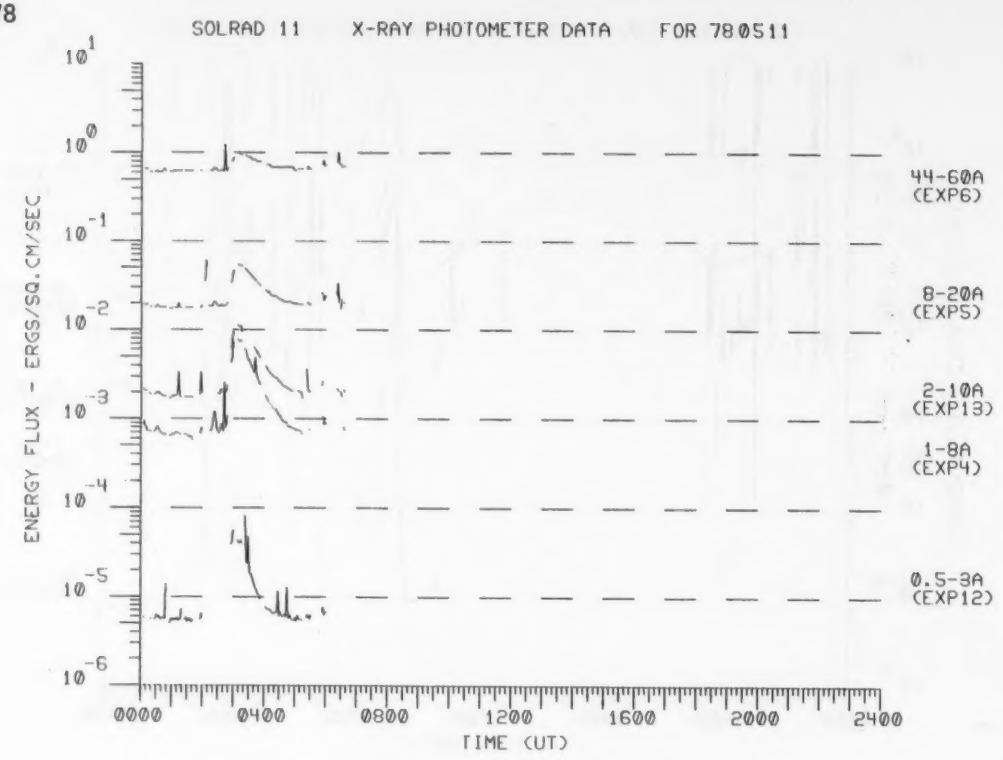

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780506
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

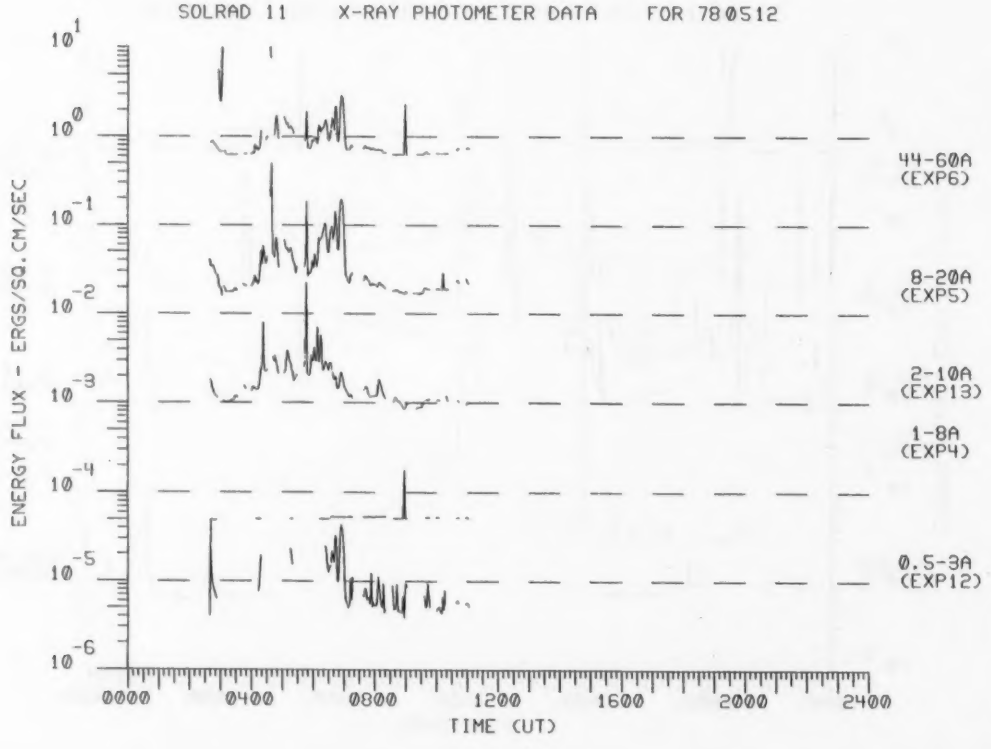

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780507
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780508
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780509
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780510
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780511
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780512
ENERGY FLUX - ERGS/SQ.CM/SEC
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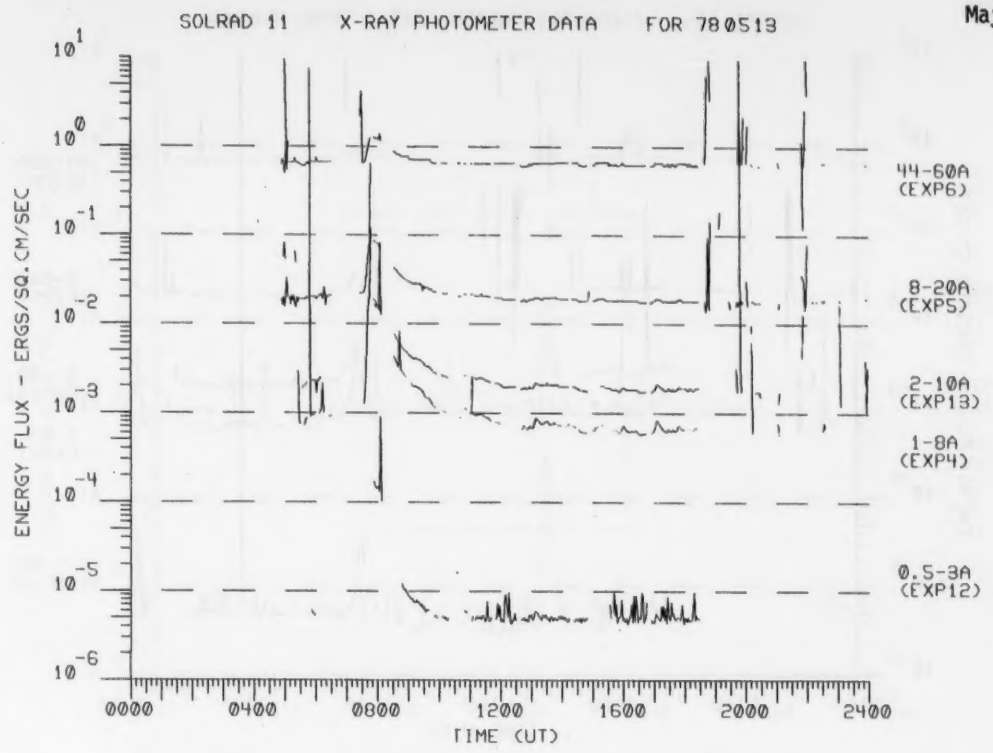
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780513
ENERGY FLUX - ERGS/SQ.CM/SEC
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10^{0}
10^{-1}
10^{-2}
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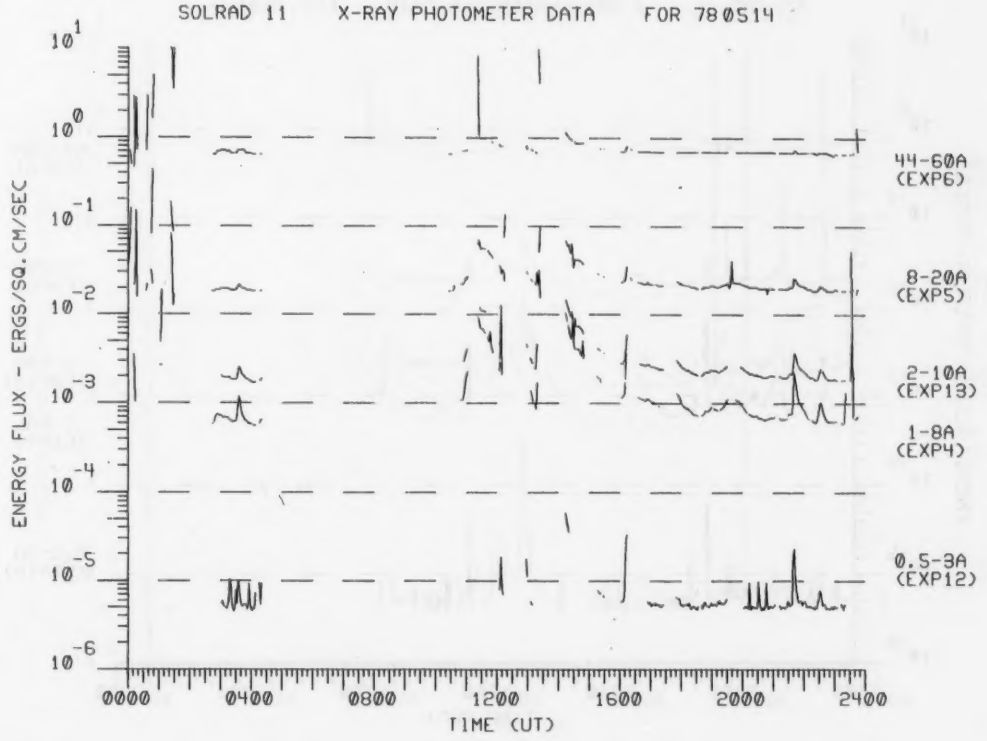
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780514
ENERGY FLUX - ERGS/SQ.CM/SEC
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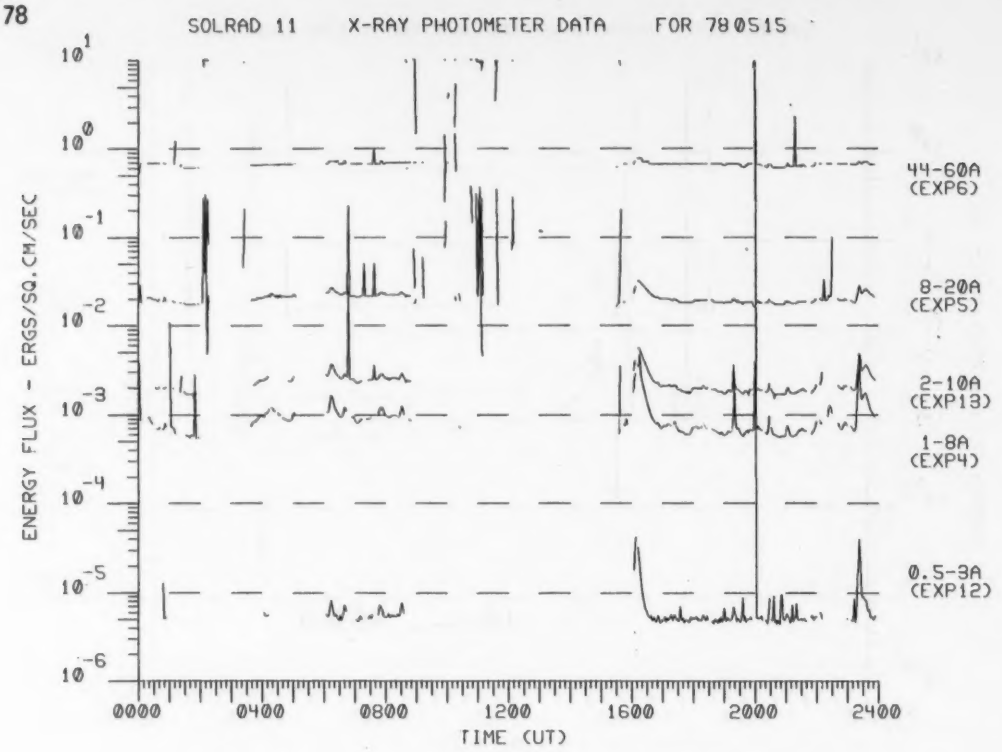
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780515
ENERGY FLUX - ERGS/SQ.CM/SEC
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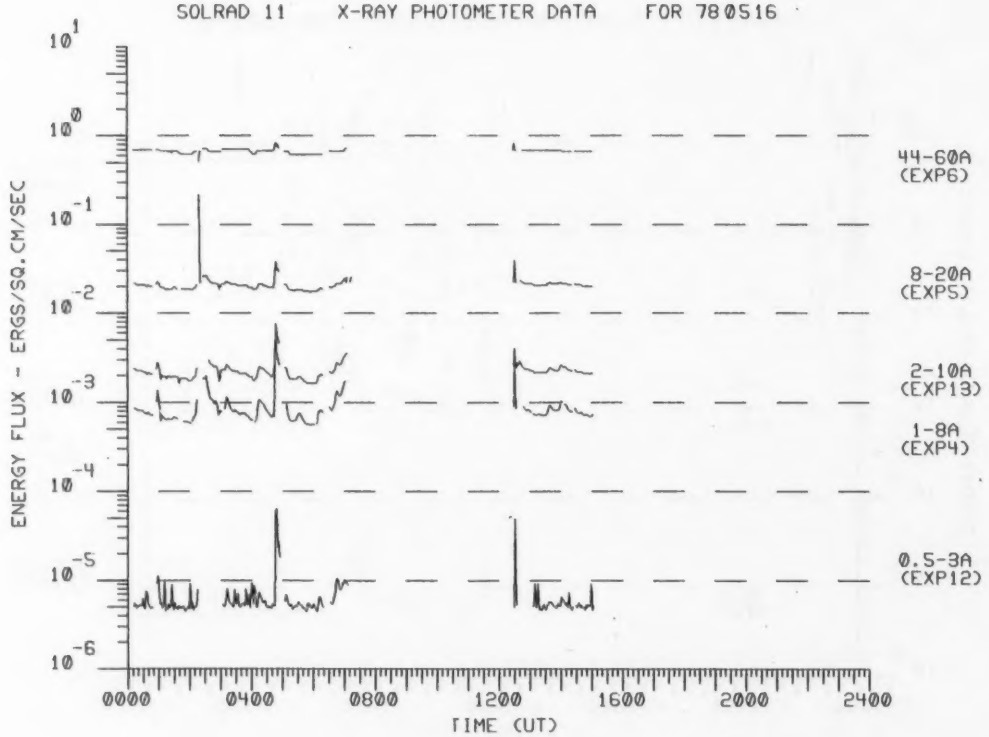
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780516
ENERGY FLUX - ERGS/SQ.CM/SEC
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10^{-1}
10^{-2}
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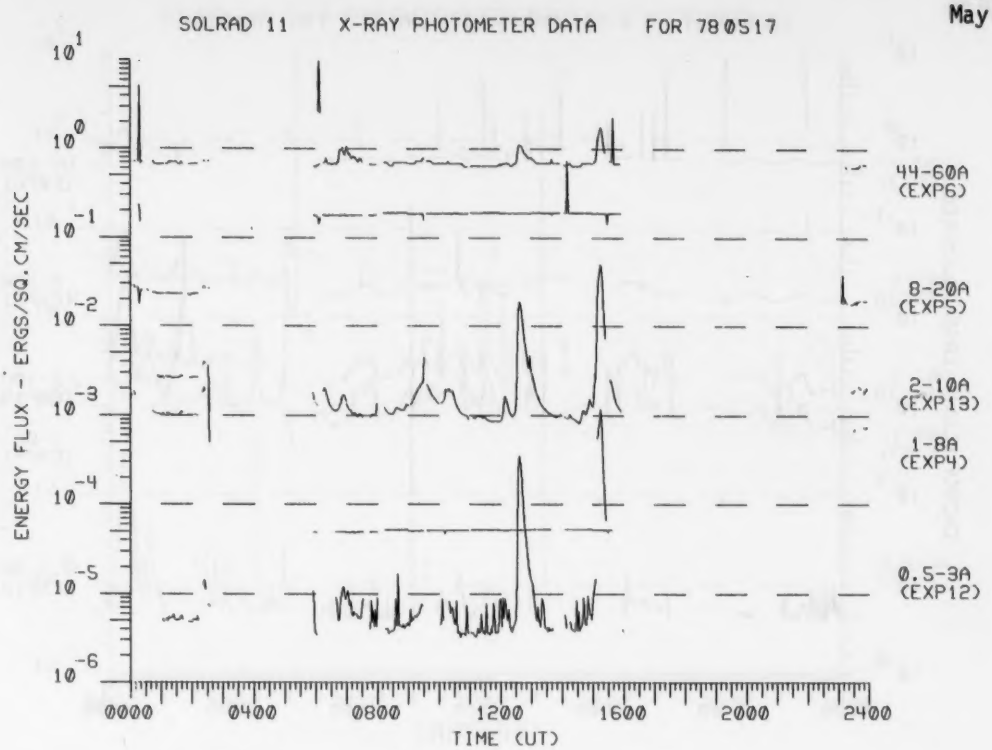
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780517
ENERGY FLUX - ERGS/SQ.CM/SEC
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10^{0}
10^{-1}
10^{-2}
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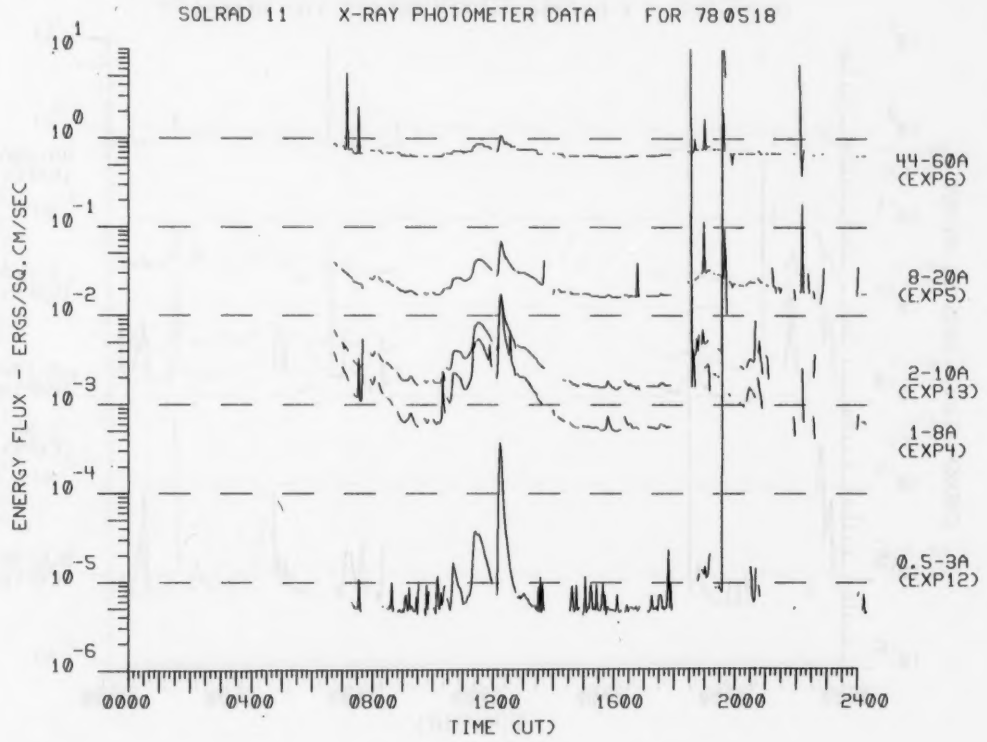
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780518
ENERGY FLUX - ERGS/SQ.CM/SEC
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10^{0}
10^{-1}
10^{-2}
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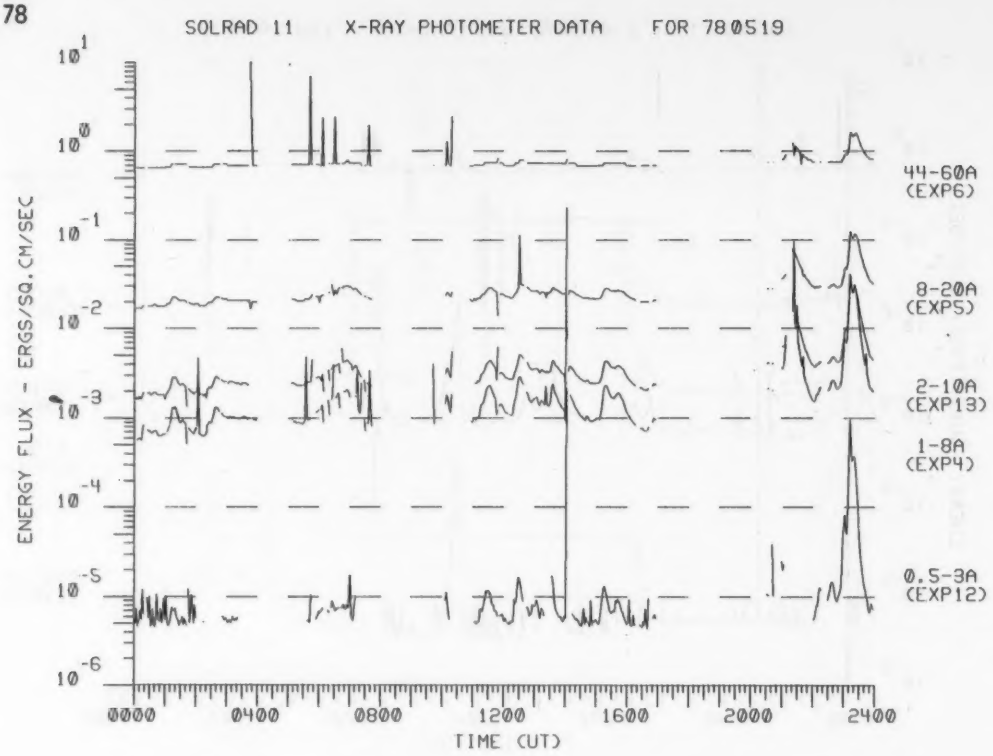
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780519
ENERGY FLUX - ERGS/SQ.CM/SEC
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10^{0}
10^{-1}
10^{-2}
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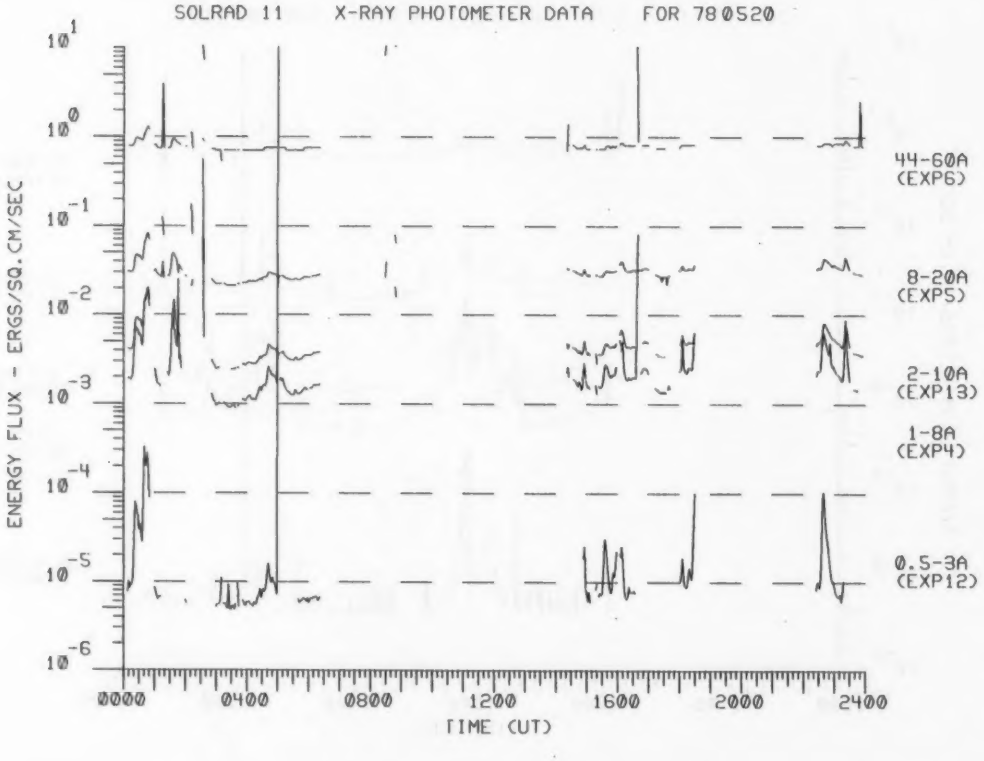
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780520
ENERGY FLUX - ERGS/SQ.CM/SEC
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10^{0}
10^{-1}
10^{-2}
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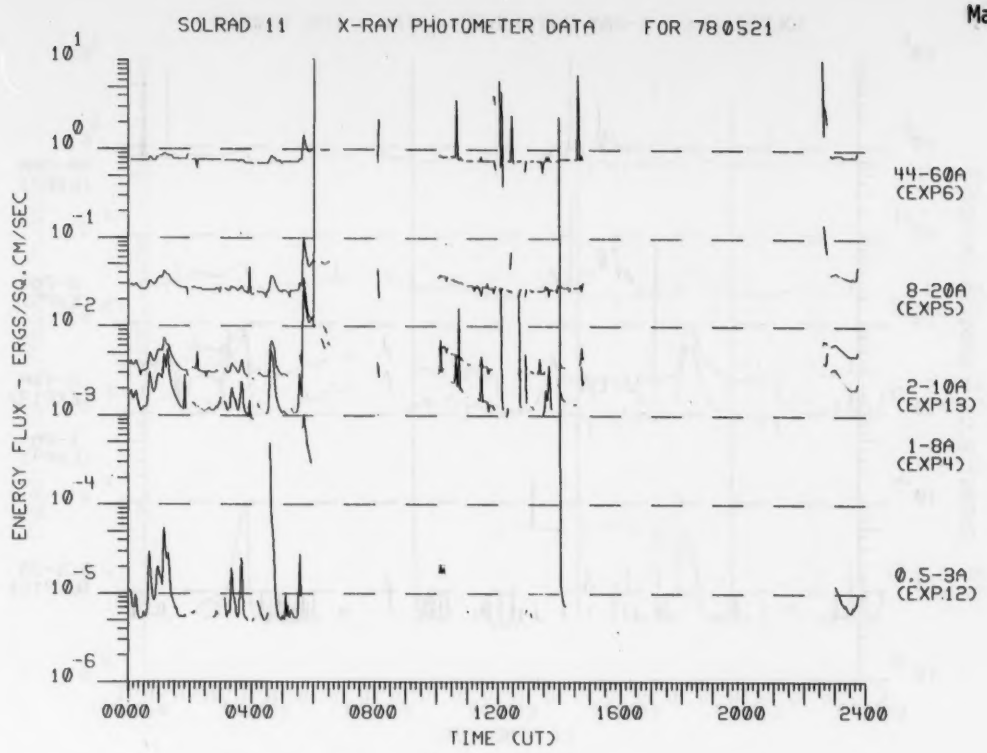
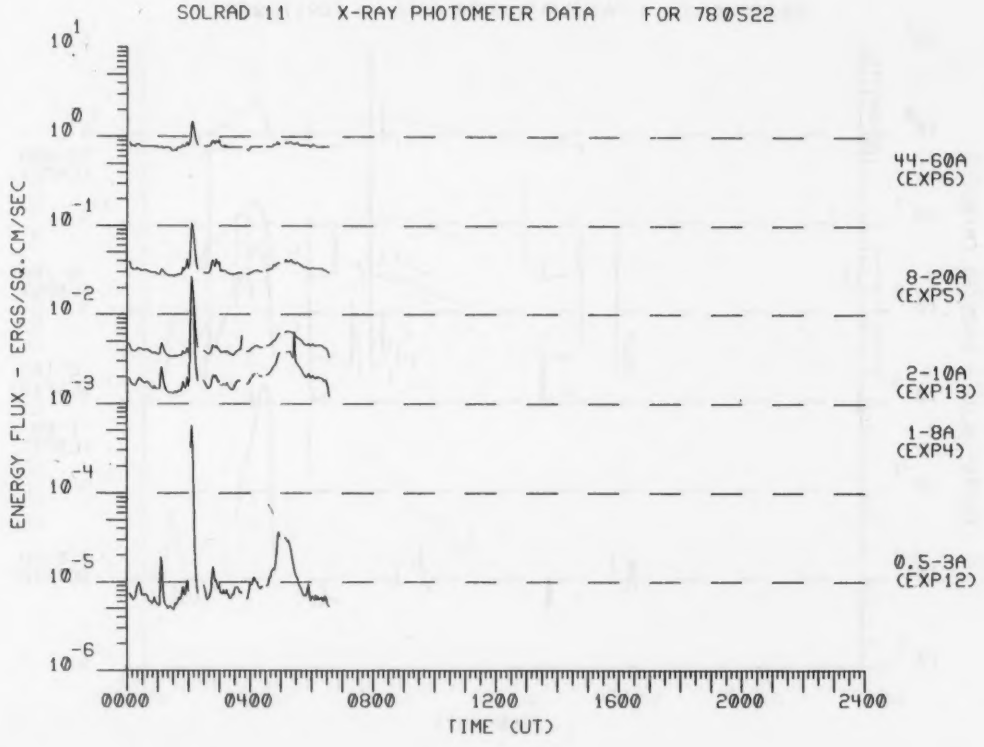
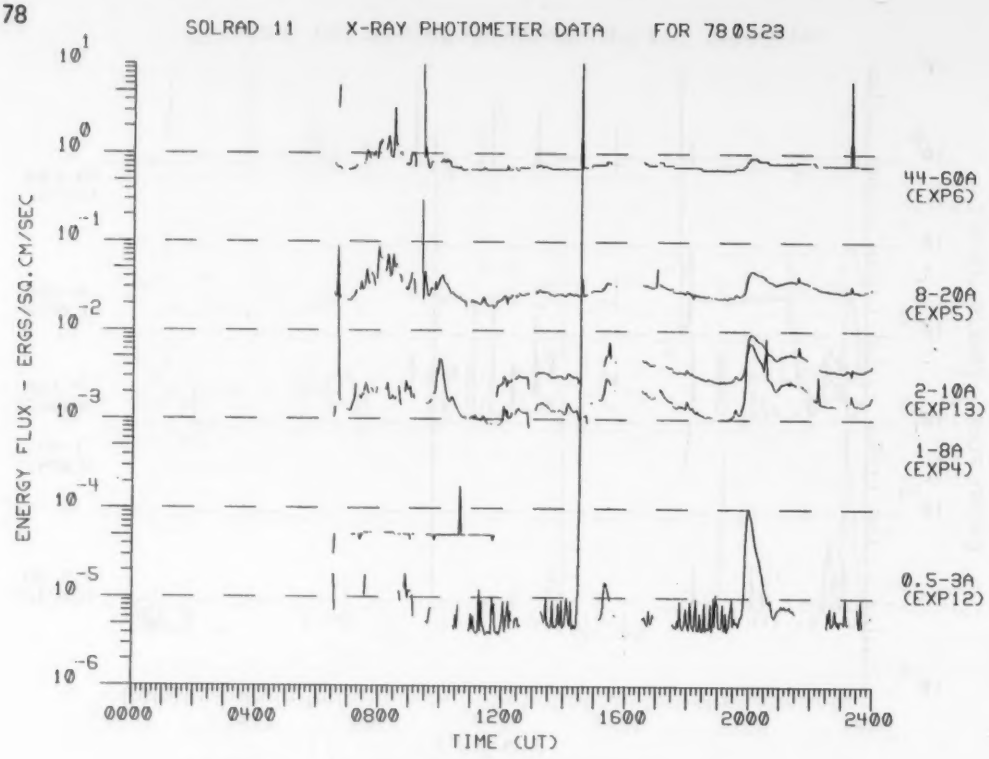
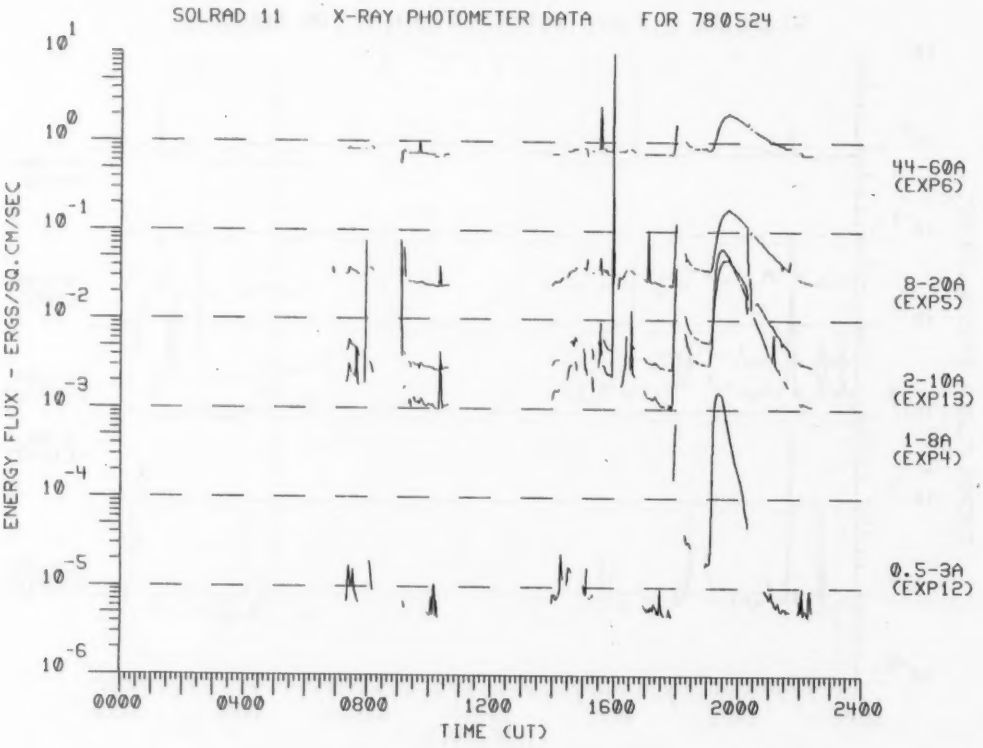
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

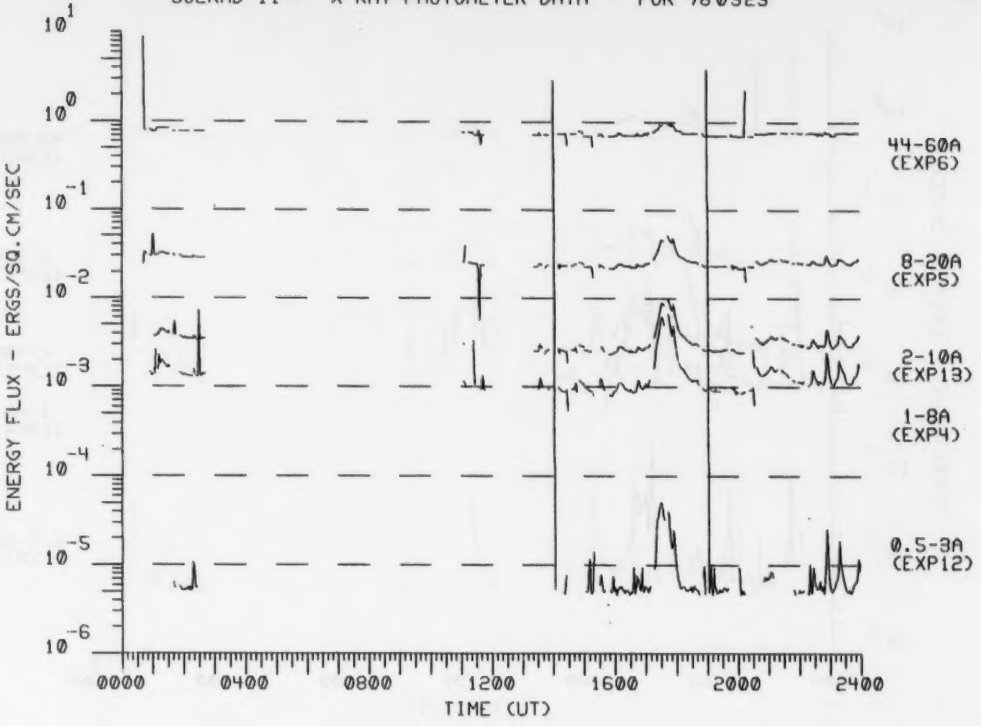

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780521
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780522
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

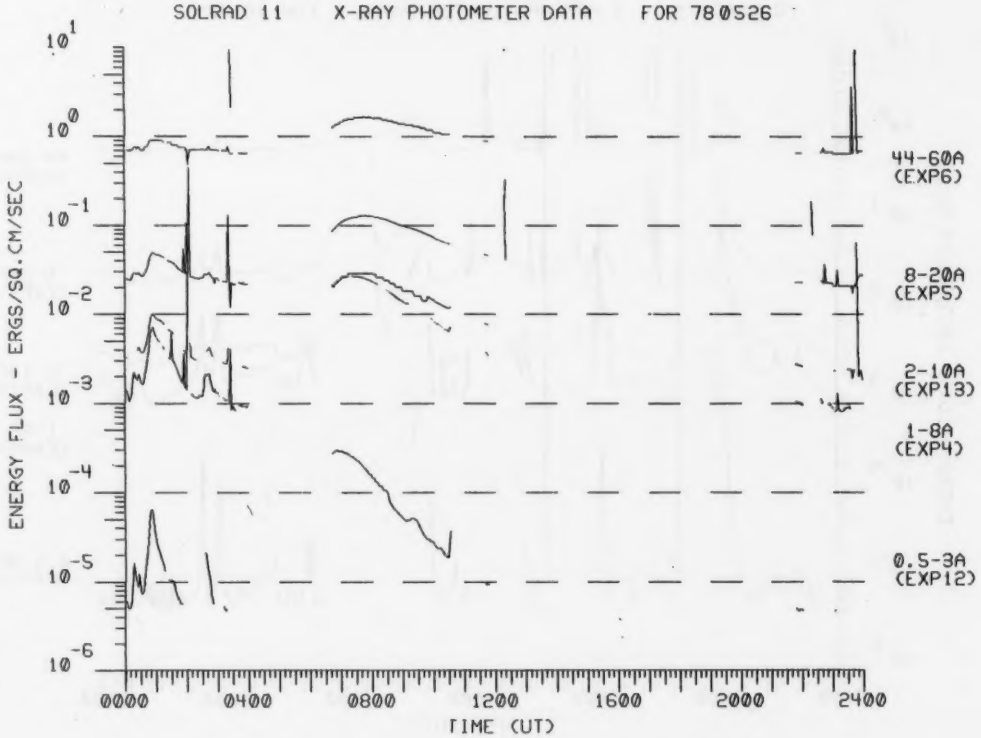

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780523
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

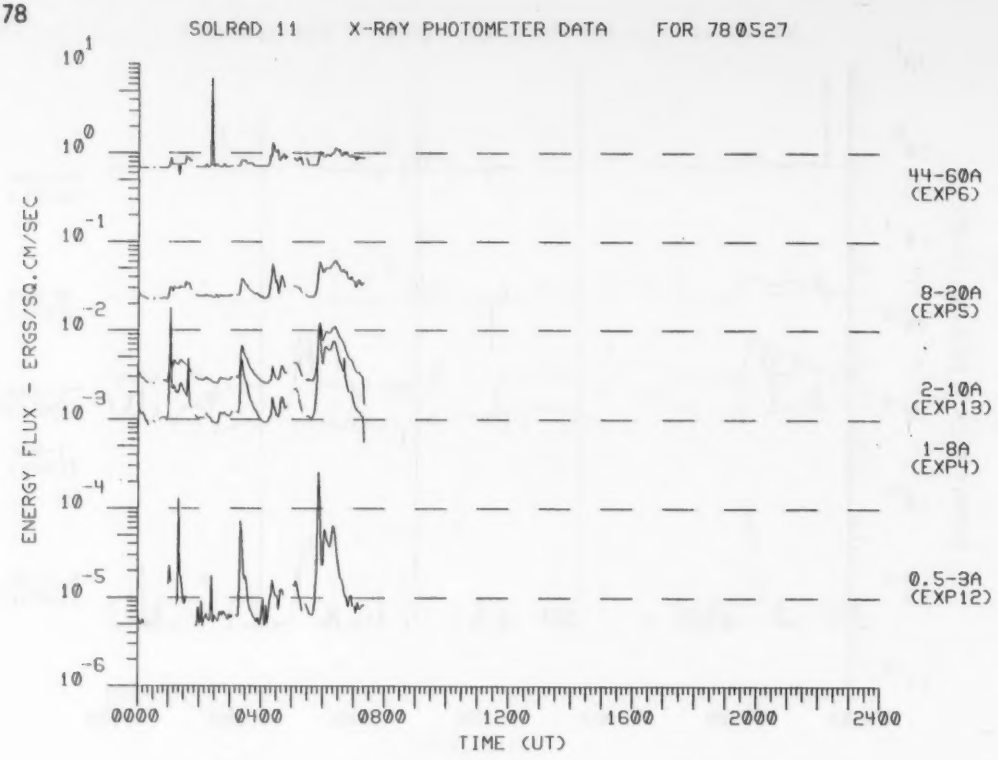

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780524
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

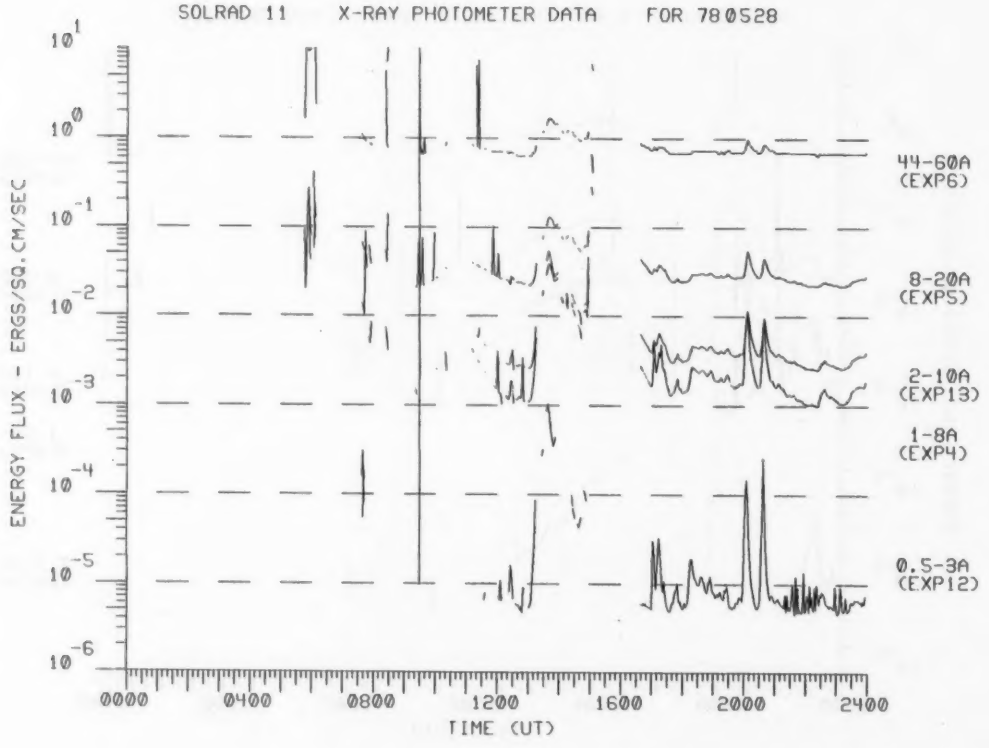
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780525

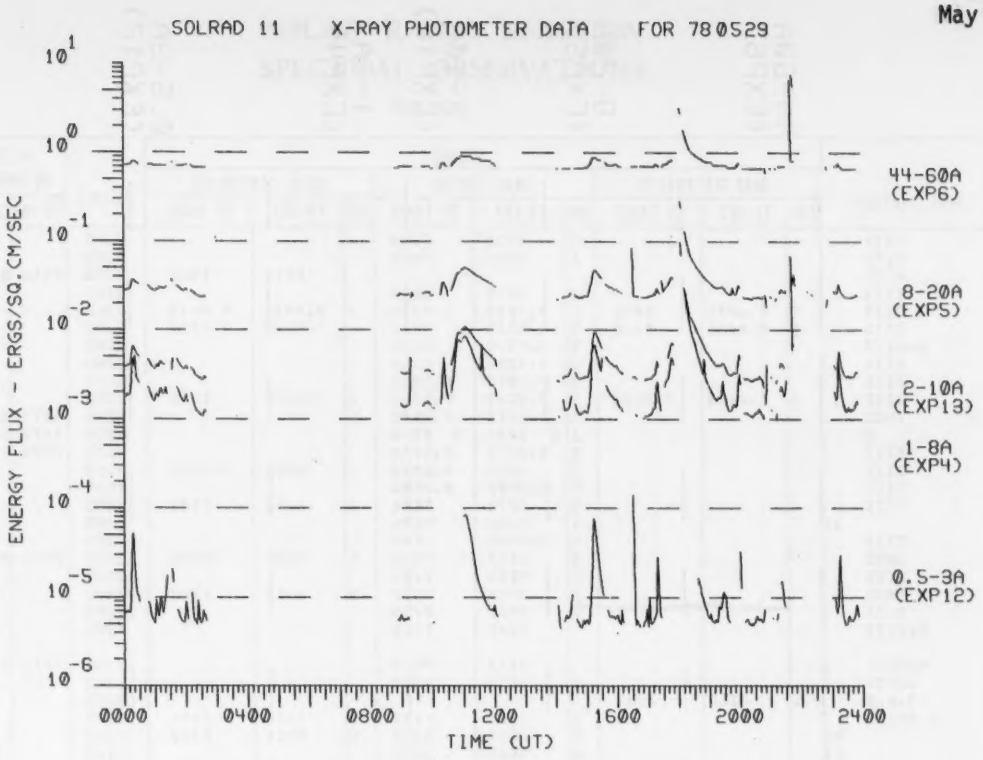


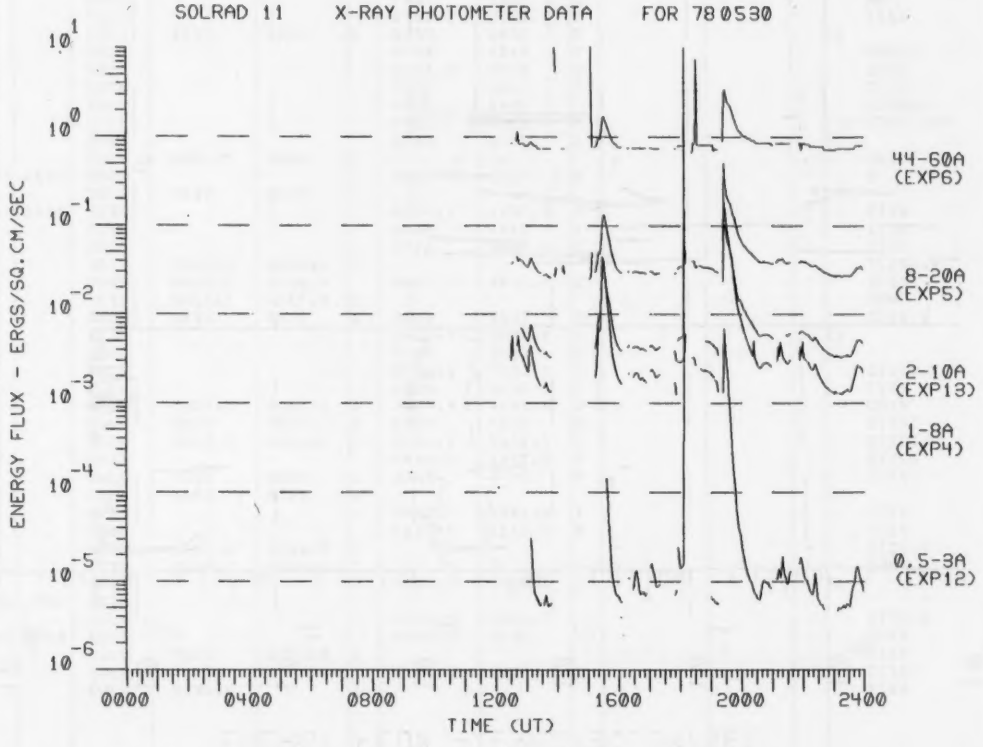
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780526

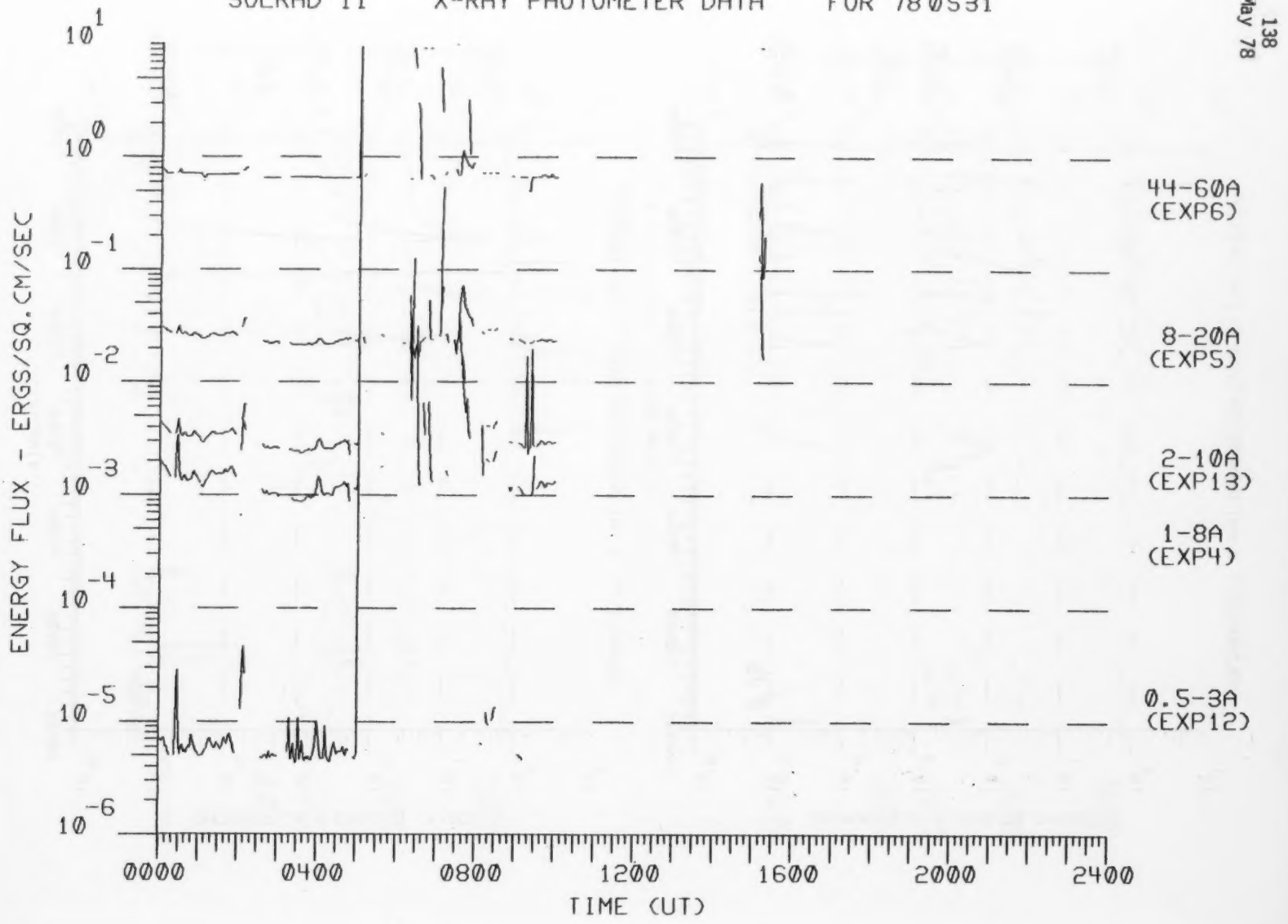



SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780527
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780528
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780529
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780530
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780531
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
01			CULG				0000	0105	2				IIIS
			CULG				0000	0728	1				IS,C
	0000	0728	CULG	0000	0728								IS,W
			CULG				0105	0728	1				IIIS
			CULG	0145.5	0146.5	1	0145.5	0146.5	2	0146	0146.5	2	IIIG
			CULG	0148.5	0149.5	1	0148	0149.5	2	0148	0148.5	1	IIIG
			CULG				0258	0259.5	2				IIIG,V
			CULG				0301	0301.5	2				IIIG
			CULG				0302.5	0303.5	2				IIIG
			CULG	0423	0424.5	1	0423.5	0424.5	2	0423.5	0424.5	1	IIIG
	0943	1756	WEIS				0436.0	1745.0	2				CONT
	0450	0640	DURN				0450 E	0640 D	1				I
	0435	0928	WEIS				0503.0	1750.0	2				IIIS
			CULG	0503.5	0506	1	0503.5	0506	2				IIIG
			DURN				0535.8	0536.8	2				IIIG
			CULG	0535	0546	1	0530	0543	2				IIIS
			CULG				0539	0543	1				II
			CULG				0631	0635.5	2				IIIS
	2030	2400	CULG	2035	2225	2	2035	2225	2				CONT
			CULG				2215	2307	1				IIIS
			CULG	2225	2145	1	2225	2245	1				CONT
			CULG				2245	2400	1				IS,C
			CULG				2307	2400					IIIS,W
02	0000	0720	CULG				0000	0115					IIIS,W
			CULG				0100	0103	1				IIIGG
			CULG							0105	0215	1	S.W.F.
			CULG	0116	0121	2	0116	0121	2				IIIGG,V
			CULG	0118	0255	2	0118	0255	2				IV
			CULG				0122	0137	1				II
			CULG				0135	0137	2				HB
			CULG				0142.5	0143.5	2				IIIG
			CULG	0255	0650	1	0255	0455	1				IV
			CULG				0306	0310	2				UNCLF
			CULG				0341.5	0342	2				IIIG
			CULG				0346	0347	2				IIIG
			CULG				0403	0406					IIIG,W
			CULG				0412.5	0419	2				II? UNCLF,HB
			CULG				0419	0450	1				II?
			CULG	0421.5	0424	1							UNCLF
	0450	1133	DURN				0450 E	1133 D	2				I
			CULG	0507	0515	1							II?
	0441	1621	WEIS				0508.0	1747.5	2				IIIN
			CULG				0508	0510	1				IIIG
			CULG				0527	0527.5	1				IIIG
			WEIS	0613.2	0624.8	3							IIIGG,V
			DURN	0613.5	0616.7		0613.5	0617.7	3				IIIGG
			WEIS	0614.0	0617.0	2							CONT
			CULG	0614	0617	1	0614	0617	2				IIIG,V
			WEIS				0616.5	0622.0	3				II
			CULG				0616	0624	2				II
			WEIS				0634.0	0643.5	3				IIIGG,V
			CULG				0634	0639	1				IIIS
			DURN	0639.4	0651.4	3	0639.4	0651.4	3				DCIM
			CULG	0639	0642	2	0639	0642	2				IIIGG
			DURN	0641.3	0651.4	2	0641.3	0651.4	3				IIIGG,N
			WEIS				0644.5	0727.5	3				IIIGG
			CULG	0645	0655	1	0642	0655	2				IIIS
			CULG	0650	0720	2							IV
			WEIS				0959.5	1001.5	3				IIIG
			WEIS				1115.0	1116.7	3				IIIG
			WEIS	1610.6	1616.7	3							IIIG,V
			WEIS	1610.7	1611.8	2							CONT
			WEIS				1618.0	1619.6	1				II
	1714	1756	WEIS										
			CULG				2041.5	2354.5					IIIS,W
	2030	2400	CULG				2041.5	2147					IS,W
			CULG	2052	2052.5	1							IIIG
			CULG				2124.5	2127	1				IIIGG
			CULG	2134.5		1							IIIB

TIME (UT)

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
02			CULG				2146.5	2149	2				IIIGG
			CULG				2147	2209.5	2				IS
			CULG				2150.5	2151.5	3				IIIG
			CULG				2154	2159	1				IIIGG
			CULG				2209.5	2356.5					IS,W
			CULG	2219.5	2221	1	2219.5	2221	1				IIIG
			CULG				2232	2232.5	1				IIIB,U
			CULG				2354.5	2400	1				IIIS
			CULG				2356.5	2400					IS,W
03			CULG				0000	0415					IS,W
	0000	0729	CULG				0000	0008	1				IIIS
			CULG				0008	0403.5					IIIS,W
			CULG				0121.5	0122	3	0121.5	0122	1	IIIB
			CULG				0123.5	0127	1				DC
			CULG				0133.5		1				IIIB
			CULG				0249.5	0306	2				IS,DC
			CULG				0253	0257	3	0254.5	0255	1	IIIGG
			CULG				0304.5	0305.5	2				IIIGG
			CULG	0306		1	0306		1				IIIB
			CULG				0403	0712	2				IIIGG,N
			CULG				0403	0714	1				IIIS
			CULG				0403	0635	2				IS,C,DC
	0441	1758	WEIS				0442.0	1750.0	2				I
			WEIS				0443.0	1737.0	2				III
			CULG	0459.5	0500	1	0458.5	0501	2	0459.5	0500	1	IIIGG
			CULG				0544.5	0546	1				DC
			CULG				0547	0547.5	2				IIIG
			CULG				0635	0719.5	2				IS,DC
			WEIS				0655.7	0712.6	3				IIIGG,V
			CULG				0655	0715	1				DC
			CULG				0658.5	0702.5	2				IIIGG
			CULG	0706	0711	1	0706	0712	2				IIIGG
			WEIS				0934.5	0947.3	3				IIIGG
			WEIS				1150.3	1308.0	3				IIIGG,V
	0529	1818	DURN				1322	1818 D	1				I,DC
			WEIS				1330.6	1330.9	3				IIIB
			WEIS				1642.5	1711.0	3				IIIGG,V
			DURN	1655.7	1702.5	3	1655.7	1702.5	3				IIIGG,N
	2030	2400	CULG				2034	2400	1				IS,C,DC
			CULG				2036	2201	1				SCINTLLTNS
			CULG				2049.5	2200					IIIS,W
			CULG				2200	2309	1				IIIS
			CULG				2309	2400					IIIS,W
04	0000	0730	CULG				0000	0725					IIIS,W
			CULG				0000	0430	1				IS,C,DC
			CULG	0116	0117								IN,W
			CULG				0430	0722.5	2				IS,DC
			WEIS				0440.0	1756.0	2				IS
			CULG	0440	0440.5	2							IIIG
	0439	1015	WEIS				0441.0	1750.0	2				IIIS
	0445	1817	DURN				0445 E	1817 D	2				I,DC
			CULG	0457	0457.5	1	0457	0504.5	2				II, HB
			WEIS				0745.0	1050.0	2				CONT
	1030	1759	WEIS				1154.0	1217.0	3				II
			WEIS				1234.8	1239.0	3				IIIGG
	2030	2400	CULG				2036	2400	2				IS,C
			CULG				2039.5	2400	1				IIIS
			CULG				2235	2237.5	2				IIIGG
			CULG	2257.5	2301	1	2257	2301.5	2	2257.5	2301.5	1	IIIGG
			CULG				2328.5	2330	2				IIIGG
			CULG	2331	2332.5	1	2331	2332.5	2	2331	2332	1	IIIGG
05	0000	0729	CULG				0000	0719	1				IS,C,DC
			CULG				0000	0716	1				IIIS
			CULG				0140.5	0218	1				RS,DP,N
			CULG	0153.5	0205.5								IS,W
			CULG				0242	0244	2				IIIGG
			CULG				0252.5	0253.5	2	0253	0253.5	1	IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
05			CULG	0259	0259.5	1	0258.5	0300	1				IIIGG
			CULG				0305.5	0311	2	0305.5	0306.5	1	IIIGG
			CULG				0317	0320.5	2				IIIGG
			CULG				0324.5	0327	2				IIIGG
			CULG				0333	0334	2				IIIG
			CULG				0333	0334	2				SLOW DRIFT
			CULG				0342.5	0359	1				SCINTLLTNS
			WEIS				0439.0	1701.0	2				IIIN
	0437	1754	WEIS				0439.0	1631.0	3				IN
	0445	1819	DURN				0445 E	1040	1				I,DC
			WEIS				0526.1	0528.8	3				IIIGG
			DURN				0526.2	0526.6	3				IIIGG
			CULG				0526	0528	2				IIIGG
			CULG				0610	0729	1				GRND REFL
			CULG				0614.5		2				IIIB
			WEIS				0614.5	0630.5	3				IIIGG
			CULG	0622	0623	1	0621	0628	2				IIIGG
			CULG	0628.5	0633	1							IIIGG
			DURN				0629.1	0631.7	3				IIIGG
			DURN	0655.2	0657.1	3	0655.2	0657.1	3				IIIGG
			WEIS				0655.2	0658.2	3				IIIGG,V
			CULG	0655	0658	1	0655	0657	2				IIIGG,V
			WEIS				0756.8	0801.0	3				IIIGG
			WEIS				1021.0	1039.0	3				IIIGG,V
			DURN	1027.1	1035.7	3	1027.1	1035.7	3				IIIGG,N
			DURN	1027.2	1029.7	3	1027.2	1029.7	3				V
			WEIS				1227.5	1228.1	2				IIIG
			WEIS				1237.0	1238.5	2				IIIG
			WEIS				1308.3	1309.6	3				IIIG
			WEIS				1316.2	1318.3	3				IIIG
			WEIS				1356.3	1357.3	3				IIIG
			WEIS				1403.0	1408.8	3				IIIG
			DURN	1403.4	1415.7	3	1403.4	1415.7	3				IIIGG,N
			WEIS				1410.8	1412.7	3				IIIG
			WEIS				1433.7	1437.6	3				IIIG
			WEIS				1445.5	1449.0	3				IIIG
			WEIS				1505.4	1512.5	3				IIIG
			WEIS				1524.2	1529.6	3				IIIG
			WEIS				1606.8	1607.7	3				IIIG
			WEIS				1633.3	1644.8	3				IIIGG
			DURN				1643.3	1643.5	3				IIIG
			WEIS				1713.0	1713.3	3				IIIG
			CULG				2038	2250	1				IS,C,DC
	2030	2400	CULG				2038	2233	1				IIIS
			CULG				2104	2111	2				DC
			CULG				2110	2110.5	2				IIIG,V
			CULG				2136	2156.5	2				IIIG,N
			CULG	2202	2208	2	2159.5	2209	3	2201.5	2202	1	IIIGG
			CULG				2233.5	2400					IIIN,W
			CULG	2243.5	2245.5	1	2243	2244.5	2				IIIGG,V
			CULG				2250	2400					IN,W
			CULG	2331.5	2332	1	2331	2332	2				IIIG
			CULG				2336	2357.5	1				N,RS,OP
			CULG	2354	2354.5	1	2354	2355	3	2354	2354.5	2	IIIG,V
06	0000	0728	CULG				0000	0033	1				IS
			CULG				0003.5	0029.5					IIIS,W
			CULG				0032	0704					IIIN,W
			CULG				0033	0656					IN,W
			CULG	0045	0045.5	1	0045	0045.5	1				IIIG
			CULG	0211	0213	1	0212	0213.5	3	0212	0212.5	2	IIIG,V
			CULG				0213	0216.5	1				IIIG
			CULG				0410	0411.5	2	0410.5		1	IIIGG
	0434	1803	WEIS				0436.3	0437.2	3				IIIG
			CULG	0436.5	0437	1	0436.5	0437.5	2	0436.5	0437.5	2	IIIG,V
			CULG				0445.5	0447	1				IIIG
			WEIS				0445.5	1412.0	2				IIIN
	0445	1818	DURN	0930	1110	1	0930	1110	1				I
			WEIS				1100.2	1110.5	3				IIIGG
			DURN	1215.1	1215.4	3	1215.1	1215.4	3				IIIG,RS

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
06			WEIS				1216.4	1217.1	2				IIIG
			DURN	1300.5	1301.0	3	1300.5	1301.0	1				IIIG
			DURN	1535.0	1535.1	3							III
	2028	2400	CULG				2028	2314	1				IS,DC
			CULG				2042.5	2043.5	1				UNCLF
			CULG				2047	2047.5	1				IIIG
			CULG				2050	2240					IIIN,W
			CULG	2058.5	2114.5	2	2040	2152	2				CONT
			CULG	2120.5	2124.5	1	2117.5	2125	3				IIIGG
			CULG				2124	2150	1				N,UNCLF,
			CULG				2152	2152.5	1				IIIG
			CULG	2158	2159	1	2157.5	2158.5	1				IIIG
			CULG				2239.5	2259	1				SCINTLLTNS
			CULG				2240	2321	1				IIIN
			CULG				2240	2321.5					IIIS,W
			CULG	2307	2321	1							IIIG,N
			CULG				2314	2400					IS,W
			CULG				2333.5	2334	1				IIIG
			CULG	2351	2351.5	1	2350.5	2351.5	2				IIIG
07	0000	0715	CULG				0000	0058					IN,W
			CULG				0008.5	0010	2				IIIG
			CULG	0008	0014		0007	0014					IIIN,W
			CULG				0104.5	0107	1				IIIGG
			CULG	0115.5	0116		0114.5	0116					IIIG,N,RS
			CULG				0126	0130	1				IIIGG,U
			CULG	0136	0139	1	0136	0139.5	2				IIIGG
			CULG				0146	0146.5	1				IIIG
			CULG	0203	0204.5	2	0203.5	0205.5	2				IIIGG,V
			CULG	0208	0210	2	0208	0210	2				IIIG
			CULG				0237.5	0249					IIIS,W
			CULG				0242		2				IIIB
			CULG	0322.5	0323	1							FAST DRIFT
			CULG	0323.5	0326.5	1	0323.5	0329.5	1				IIIN
			CULG				0325	0710					IIIS,W
			CULG							0326	0405	1	S.W.F.
			CULG	0327.5	0500	2	0329	0348	3	0333	0348	3	IV
			CULG	0327	0328.5	3	0327.5	0355	3				II, HB
			CULG				0333	0348	2	0333	0348	2	IIIS
			CULG				0348	0352	2				IV
			CULG				0418	0456	1				IIIG,N
	0440	0712	DURN	0440 E	0517	2	0440 E	0517	3				IV
			CULG				0455.5	0456.5	1				FAST DRIFT
			CULG	0500	0710	1	0352	0516	1				IV
	0433	1124	WEIS				0515.0	1539.0	2				IIIN
			CULG				0516	0715					IV, W
			WEIS				0519.5	0520.7	2				IIIG
			CULG				0519	0520.5	1				IIIGG
			DURN				0522.1	0529.6	3				IIIG,N
			CULG	0522	0532	1							IIIG,N
			CULG	0523	0523.5	2							IIIG
			WEIS				0525.5	0527.5	3				IIIG
			CULG				0526	0527.5	2				IIIG,V
			WEIS				0735.3	0741.3	3				IIIGG
			WEIS				0812.2	0812.8	2				IIIG
			WEIS				0835.9	0838.1	3				IIIG
			WEIS				0852.9	0906.0	2				IIIGG
			WEIS				1000.8	1005.7	3				IIIGG
			WEIS				1119.9	1120.5	3				IIIG
	1138	1205	WEIS										
	1249	1816	DURN				1249 E	1816 D	1				I,DC
	1227	1805	WEIS				1529.8	1537.0	3				IIIGG,V
			DURN				1531.1	1531.7	3				IIIGG,U
			DURN	1533.2	1535.1	3	1533.2	1535.1	3				IIIGG
			WEIS				1550.0	1557.5	3				IIIGG,V
			DURN	1550.1	1551.8	3	1550.1	1551.8	3				IIIGG
			DURN	1550	1602	1	1553	1602	2				DCIM
			WEIS				1555.0		2				II
			WEIS				1555.0	1706.0	3				IV
			DURN	1709.9	1710.4	3							IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
07			WEIS				1710.0	1711.5	3				IIIG
			DURN	1758.3	1758.7	2							IIIG
			WEIS				1758.8	1805.0	3				
	2029	2400	CULG	2041	2045								IS,W
			CULG				2046	2128	1				IS
			CULG				2053	2129	1				IIIS
			CULG	2123.5	2124.5	2	2123.5	2125	2				IIIGG,U
			CULG				2134	2400					IN,W
			CULG				2139	2348	1				IIIN
			CULG				2233.5	2236	1				IIIG
			CULG				2249.5	2250.5	2				IIIG,V
			CULG				2251.5	2254	1				IIIG
			CULG				2357.5	2358	1	2357.5	2358	1	IIIG
08	0000	0728	CULG				0000	0728					IS
			CULG				0012.5		1				IIIB
			CULG				0034.5	0042					IIIGG,W
			CULG				0036	0036.5	2	0036	0036.5	1	IIIG
			CULG							0040	0121	1	S.W.F.
			CULG				0139	0404	1				IIIG,N
			CULG	0155	0205	1							IV
			CULG	0203	0203.5	1							IIIG
			CULG	0205	0216	2	0212.5	0252	2				IV
			CULG				0207.5	0220	2	0216.5	0217	1	II, HB
			CULG							0211	0355		S.W.F.
			CULG	0216	0335	1	0252	0455	1				IV
			CULG				0223	0225	2				DC
			CULG	0323.5	0328	1	0325.5	0330	2	0327.5		1	IIIGG,V,U
			CULG	0355	0728		0455	0728					IV, W
			CULG				0357	0407.5	2	0403.5	0404	1	IIIN
	0431	1800	WEIS				0539.0	1726.1	2				IIIN
			CULG	0622.5	0623	1	0622.5	0623	1				IIIG
	0442	1820	DURN	0622.8	0623.0	1	0622.8	0623.0	1				IIIG
			DURN	0630.3	0630.4	1	0630.3	0630.4	2				IIIG
			CULG	0630	0630.5	1							IIIG
			CULG	0633.5	0635.5	1	0633.5	0635.5	1				IIIG
			DURN	0633.7	0635.3	1	0633.7	0635.3	3				IIIGG
			WEIS				0633.7	0635.5	2				IIIG
			CULG				0644.5	0647	1				IIIGG
			WEIS				0645.7	0647.0	2				IIIG
			DURN	0709.9	0712.3	1	0709.9	0712.3	3				IIIGG
			CULG	0710.5	0712.5		0710	0710.5					IIIGG,W
			WEIS				0743.1	0746.1	3				IIIGG
			WEIS				0806.0	0809.5	3				IIIGG
			WEIS				0932.1	0940.0	3				IIIGG,V
			WEIS				1002.6	1006.3	2				IIIGG
			DURN	1122.1	1122.2	2	1122.1	1122.2	3				IIIG
			DURN	1211.1	1214.5	3	1211.1	1214.5	3				II
			WEIS				1211.2	1320.0	3				IV
			DURN	1213	1324	3	1213	1324	3				IV
			WEIS				1313.0	1325.0	3				IV
			WEIS				1543.5	1547.5	3				IIIG,V
			DURN				1819.4	1819.4	1				III
	2029	2400	CULG				2051	2052.5					IIIG,W
			CULG				2100						IIIB,W
			CULG				2144						IIIB,W
			CULG				2159.5	2200					IIIG,W
			CULG				2257.5		2				IIIB
09	0000	0728	CULG	0012.5	0228		0121	0154					IN,W
			CULG				0159.5						IIIB,W
			CULG	0241	0242.5		0241	0242.5					IIIG,W
			CULG				0304	0304.5					IIIG,W
			CULG	0330	0335		0330	0335					IIIN,W
			CULG				0342.5	0343.5					IIIG,W
			CULG				0356	0357	1				IIIG
			CULG				0439.5						IIIB,W
			CULG				0559						IIIB,W
			CULG				0625.5	0716	2				II
	0441	1818	DURN	1436.7	1440.8	3	1436.7	1440.8	3				II

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
09	0430	0508	WEIS				1439.3	1459.5	2				II
			DURN	1441.4	1600	2	1441.4	1600	2				IV
	0643	1807	WEIS				1444.0	1600.0	3				IV
	2029	2400	CULG				2102.5						IIIB,W
			CULG	2142		1	2141.5	2142.5	1				IIIG
			CULG				2208.5						IIIB,W
			CULG				2320.5	2321					UNCLF,W
10	0000	0728	CULG				0041.5	0043	2				IIIG
			CULG				0213.5						IIIB,W
			CULG	0242	0242.5		0243						IIIG,W
			CULG	0403.5		1	0403.5		1				IIIB
	0440	1816	DURN										
	0728	1610	WEIS										
	1651	1807	WEIS										
	2029	2400	CULG	2116.5	2119		2117	2119					IIIG,W
			CULG	2124	2124.5		2123.5	2124.5					IIIG,W
			CULG	2126.5	2127.5		2126.5	2127.5					IIIG,W
			CULG				2156.5	2157					IIIG,W
			CULG				2201.5	2206.5	2				IIIGG,V
			CULG				2206	2224	3	2213.5	2220.5	1	II, HB
11	0000	0728	CULG				0251	0256					IIIN,W
			CULG	0256.5	0258.8	1	0256.5	0258.5	2				IIIGG
			CULG				0259.5	0332.5	3	0303.5	0308.5	2	II, HB
			CULG				0315	0728					IS,W
			CULG				0315	0728	1				IIIN
			CULG				0315	0728	1				IV
	0429	1807	WEIS				0735.3	0751.0	2				II
	0439	1506	DURN	0735.3	0738.4	3	0735.3	0738.4	3				II
			DURN	0737.6	0737.7	3	0736.6	0737.7	3				IIIG
			WEIS				0737.6	0743.0	2				IIIGG
			DURN	0742	0806	1	0742	0806	2				IV
			WEIS				0751.0	0753.5	2				IIIG
			WEIS				1215.5	1216.0	2				IIIG
	2029	2400	CULG	2329.5	2331.5	1	2329.5	2333	2				IIIGG
12	0000	0726	CULG				0009	0013					IIIG,RS,W
			CULG				0123						IIIB,W
			CULG	0124			0124						IIIB,W
	0428	0820	WEIS										
	0637	1819	DURN										
	0926	1809	WEIS										
13	0000	0728	CULG										
	0438	1817	DURN										
	0426	1540	WEIS				0740.2	0741.6	1				IIIG
			WEIS				0743.1	0756.5	3				IV
			WEIS				0757.0	0812.0	3				II
			WEIS				1511.1	1511.4	2				IIIG
	1559	1818	WEIS				1624.3	1624.4	1				IIIB
			WEIS				1644.1	1644.2	1				IIIB
			WEIS				1722.0	1722.2	1				IIIB
	2028	2400	CULG										
14	0000	0728	CULG										
	0437	1819	DURN										
	0426	1812	WEIS				1353.3	1353.7	1				IIIB
			WEIS				1357.0	1403.3	3				IIIGG
			WEIS				1447.0	1505.0	1				II
			WEIS				1510.4	1511.4	2				IIIG
	2028	2400	CULG										
15	0000	0340	CULG				0119.5	0121.5	1				IIIG
			CULG				0158.5	0200	1				IIIG
			CULG				0242.5	0243	1				IIIG
	0435	1816	DURN										
	0500	0628	CULG										
	0424	0902	WEIS				0549.0	1811.0	2				IIIN
	0633	0728	CULG										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
15			WEIS				0810.3	0811.7	3				IIIG
	0952	1813	WEIS				1533.6	1534.4	2				IIIG
			WEIS				1626.8	1627.6	2				IIIG
	2028	2400	CULG				2119.5	2120.5	1				IIIG
			CULG				2219	2219.5	1				IIIG
			CULG				2339	2340.5	1				IIIG
16	0000	0728	CULG				0028.5	0029	1				IIIG
			CULG				0241.5	0243	1				IIIG
			CULG				0331.5	0332	1				IIIG
			CULG				0411	0412	1				IIIG
			CULG				0436.5	0707					IIIS,W
	0424	1613	WEIS				0443.0	1613.0	2				IIIN
			CULG				0454.5	0455	1				IIIG,U
			CULG				0521		1				IIIG
			CULG				0558		1				IIIB
			CULG				0606		1				IIIB
			WEIS				0617.2	0621.5	2				IIIGG
			CULG				0617	0621	1				IIIGG,V
	0434	1817	DURN				0642.3	0642.3	2				IIIG
			WEIS				0649.7	0700.2	3				IIIG
			CULG				0659.5	0700	2				IIIG
			WEIS				0703.0	0707.6	3				IIIG
			CULG				0703	0703.5	1				IIIG
			DURN	0705.2	0706.6	1	0705.2	0706.6	2				IIIG
			CULG				0705	0705.5	2				IIIG
			CULG				0706.5		1				IIIG
			CULG				0707.5		1				IIIB
			WEIS				0741.9	0742.3	3				IIIB
			WEIS				0839.1	0840.2	3				IIIG
			WEIS				0915.5	1613.0	2				IN
			WEIS				0925.0	0927.5	3				IIIG
			WEIS				0930.7	0931.5	3				IIIG
			WEIS				0954.7	0957.2	3				IIIG
			DURN				1330	1817 D	1				I
	1647	1814	WEIS										
	2028	2400	CULG				2101	2400					IS,W
			CULG				2112	2341					IIIN,W
			CULG				2154.5	2156	1				IIIGG
			CULG	2157	2157.5	2	2157	2159	3				IIIGG,V
			CULG				2225	2237					IIIS,W
17	0000	0726	CULG				0000	0316.5					IN,W
			CULG				0026	0138.5					IIIS,W
			CULG	0027.5	0028	1	0027.5	0029	1				IIIG,U
			CULG				0138.5	0657					IIIS,W
			CULG				0316	0442					IN,W
			CULG				0425	0432	1				II
	0421	1714	WEIS				0430.0	1349.6	1				IIIN
			CULG				0432	0706	1				IS,DC
			CULG				0527		1				IIIB
	0433	1820	DURN				0900	1040	1				I
			WEIS				1502.3	1505.8	3				IIIGG
			DURN				1502.5	1504.7	2				IIIGG
	2030	2400	CULG				2057	2300					IN,W
			CULG				2059	2400					IIIS,W
			CULG				2301	2400	1				IS,DC
			CULG	2336.5									IIIG,W
18			CULG				0000	0036					IS,W
	0000	0728	CULG				0000	0226					IIIS,W
			CULG				0036	0309	1				IS,DC
			CULG				0226	0553					IIIN,W
			CULG				0309	0411					IN,W
	0432	1818	DURN				0432 E	1818 D	1				IS
	0420	0949	WEIS				0441.0	1751.0	1				IIIN
			CULG				0506.5	0507.5	1				IIIG
			WEIS				0516.3	0520.5	3				II
			CULG				0516	0532	3				II, HB
			WEIS				0519.3	0520.5	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
18			WEIS				0520.0	0532.0	3				IVR S
			CULG	0530.5	0534.5	1							I
			CULG				0530	0545	1				IV
			WEIS				0533.0	0538.0	1				II
			CULG				0553	0653.5					IIIS,W
			CULG				0608	0608.5	1				IIIG
			CULG	0623.5	0626	1	0624.5	0628.5	1				IIIGG
			CULG	0630	0634	1	0631.5	0633.5	1				UNCLF
			CULG				0634	0651					IN,W
			WEIS				0721.0	1734.0	2				IN
			WEIS				0730.0	1440.0	2				CONT
	0947	1815	WEIS				1751.3	1753.3	2				IIIG
			DURN	1751.3	1755.0	3	1751.3	1753.2	3				IIIG
			DURN	1752	1755								DCIM
	2029	2400	CULG				2046	2400	1				IIIS
			CULG				2105	2242					IS,W
			CULG				2242	2400	1				IS,DC
19	0000	0728	CULG				0000	0649					IIIS,W
			CULG				0000	0129	1				IS,DC
			CULG				0129	0258					IN,W
			CULG	0138	0138.5								IIIG,W
	0420	1405	WEIS				0425.3	1730.5	1				IIIN
	0433	1819	DURN	0511.0	0511.2	1							IIIG
			DURN				1118	1210	1				I
	1504	1816	WEIS				1112.7	1126.0	3				IIIGG
	2029	2400	CULG	2100	2308		2107	2400					IN,W
			CULG				2109	2400					IIIS,W
			CULG				2143.5	2144	1				IIIG
20	0000	0728	CULG				0000	0704					IIIS,W
			CULG				0014.5		1				IIIB
			CULG	0034	0036.5		0037	0710					IS,W
	0432	0641	DURN				0432 E	0641 D	1				I
	0419	1819	WEIS				0439.2	1710.5	1				IIIN
			DURN	0556.8	0557.0	1							IIIG
			CULG				0600.5	0601.5	1				IIIB,V
			WEIS				0600.8	0602.5	2				IIIG
			CULG				0602	0602.5	1				IIIG
			WEIS				1318.2	1318.3	2				IIIG
	1504	1819	DURN				1504 E	1819 D	2				I,DC
			WEIS				1635.0	1641.8	2				IIIGG
	2028	2400	CULG	2048	2255								IS,W,C
			CULG				2109	2219					IIIN,W
			CULG				2126.5	2326	1				IS
			CULG	2255	2400								IS,W
21	0000	0728	CULG				0007.5						IIIB,U,W
			CULG				0102	0102.5	1	0102	0102.5	1	IIIG
			CULG				0105.5	0106.5					IIIG,W
			CULG	0109.5	0658								IN,W
			CULG				0216.5		1				IIIB
			CULG				0218.5	0219.5					IIIG,W
			CULG				0227	0708					IIIN,W
	0432	1816	DURN				0432 E	1816 D	1				I,DC
	0416	0740	WEIS				0503.5	1736.0	1				IIIN
			CULG				0546		2				IIIB
			WEIS				0720.8	0721.0	1				IIIG
			WEIS				0722.3	0722.6	1				IIIG
			DURN				1526.7	1526.8	3				IIIG
			WEIS				1607.7	1607.8	3				IIIG
	0935	1819	WEIS				1626.7	1527.8	3				IIIG
			WEIS				1650.0	1652.5	3				IIIG
			WEIS				1759.7	1800.4	3				IIIG
	2028	2400	CULG				2046.5	2049	1				IIIGG
			CULG	2049	2400	1							IS,C
			CULG				2104	2150.5					IN,W
			CULG				2129	2129.5					IIIG,W
			CULG	2138.5	2148.5	1	2136	2147.5	2				IIIGG,V
			CULG				2325	2328	1				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
21			CULG				2349	2353	2				IIIGG
22			CULG				0000	0717					IIIN,W
	0000	0728	CULG	0000	0236	1							IS,C
			CULG	0037		1	0034.5	0039	1				IIIG
			CULG				0147.5	0148	1				IIIG
			CULG	0204.5	0205	2	0203.5	0206.5	3	0204.5	0206	2	IIIGG,V,U
			CULG				0206.5	0210	1				IIIGG
			CULG				0210	0216.5					IIIGG,W
			CULG	0308	0309	1	0308	0309.5	2	0308.5	0309	1	IIIGG,V,U
			CULG	0310	0310.5	1	0310.5	0312	1				IIIG
			CULG				0310	0319	1				IIIN
			CULG				0315.5	0316	2				IIIG
			CULG				0325.5	0326	1				IIIB
			CULG				0345.5	0346	1				IIIG
	0432	1818	DURN				0432 E	1818	1				IS,W
	0417	1533	WEIS				0444.0	1814.3	2				IIIN
			CULG				0454.5	0455	1				IIIG
			CULG				0510	0510.5	1				IIIG
			CULG				0609	0610.5	1				IIIG
			CULG				0619	0621	2				IIIG
			WEIS				0714.3	0718.4	3				IIIGG
			DURN	0716.3	0717.3	1	0716.3	0717.3	2				IIIGG
			WEIS				0729.8	0730.4	2				IIIGRS,U
			DURN				0730.1	0730.3	2				IIIG
			WEIS				1039.1	1040.3	2				IIIG
			DURN				1046.2	1046.7	3				IIIG
			WEIS				1046.3	1049.1	3				IIIG
			DURN				1100	1400	1				I
			WEIS				1338.3	1340.0	3				IIIG
			WEIS				1430.7	1435.6	3				IIIG
			DURN				1431.8	1434.0	3				IIIGG
			WEIS				1438.8	1440.8	1				II
	1610	1821	WEIS				1623.9	1628.7	3				IIIGG,V
			DURN	1624.4	1625.1	3	1624.4	1625.1	3				IIIGG
	2030	2400	CULG				2143.5	2400					IIIN,W
			CULG	2313	2313.5	1	2312	2313.5	1				IIIGG
			CULG	2333	2334								IIIG,W
23	0000	0728	CULG				0000	0436					IIIN,W
			CULG	0010.5		1							IIIB
			CULG				0044.5	0046	1				IIIG
			CULG				0104.5	0108	1				II? UNCLF
			CULG				0116	0119					UNCLF,W
			CULG	0230.5	0231	1	0230.5	0231.5	1				IIIG
	0417	1822	WEIS				0523.1	0524.5	2				IIIG
			CULG				0523	0524.5	1				IIIG
			WEIS				1122.8	1123.0	2				IIIB
			WEIS				1129.5	1129.8	2				IIIG
	0432	1400	DURN	1129.5	1129.8	3	1129.5	1129.8	3				IIIG
	2029	2400	CULG										
24	0000	0728	CULG				0059						IIIB,W
			CULG				0124	0125					IIIG,W
			CULG				0316		1				IIIB
			CULG				0347	0348	2				IIIG,U
			CULG				0509.5	0511.5					IIIG,W
			CULG	0551.5	0554	1	0553	0554	1				IIIG
			CULG				0631		1				IIIB
			CULG				0633	0652	1				IS
	0418	0812	WEIS				0653.3	0655.0	2				IIIG
			CULG				0656.5	0657	1				IIIG
			CULG	0701.5	0702	1	0701	0702.5	1				IIIG
			CULG				0706.5	0707					IIIG,W
			WEIS				0756.7	0757.1	2				IIIG
			WEIS				0800.8	0802.7	2				IIIG
			WEIS				0830.5	0831.1	2				IIIG
	0833	1823	WEIS				0941.2	0945.3	2				IIIG
			WEIS				1227.9	1228.8	2				IIIG
			WEIS				1752.4	1755.8	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
24			WEIS				1758.2	1807.6	3				IIH
	2029	2400	CULG	2122	2123.5	1	2121.5	2124	1				IIIGG,U
			CULG				2137	2138					IIIG,W
			CULG				2332	2354					IIIN,W
			CULG				2336.5	2337.5	2	2336.5	2337	1	IIIG,V,U
			CULG				2341.5	2343					IIIGG,W
			CULG				2352.5	2353	2	2352.5	2353	1	IIIG
25	0000	0729	CULG				0021	0624					IIIN,W
			CULG				0042.5		1				IIIB
			CULG				0321.5	0322.5	1				IIIG
			CULG				0334.5	0336	1				IIIGG
			CULG				0335.5	0336	1				UNCLF
			CULG				0344.5	0345	1				SLOW DRIFT
			CULG				0454.5	0455.5	1				IIIG,U
	0416	1401	WEIS				0454.5	0455.5	2				IIIG,U
			CULG	0612.5	0613.5	1	0612.5	0613	1				IIIG
			WEIS				0612.8	0613.1	2				IIIG
			CULG	0615.5	0616.5	1							FAST DRIFT
			WEIS				0617.8	0617.9	1				IIIB
			WEIS				0723.1	0723.2	1				IIIG
			WEIS				0802.8	0803.3	1				IIIG
			WEIS				1213.3	1214.4	1				IIIG
			WEIS				1307.5	1307.7	1				IIIB
			WEIS				1327.0	1327.2	1				IIIB
			WEIS				1329.5	1329.9	2				IIIG
			WEIS				1331.9	1333.1	1				IIIG
	1420	1824	WEIS				1527.7	1528.5	2				IIIG
			WEIS				1531.1	1532.1	1				IIIG
			WEIS				1533.2	1533.2	2				IIIB
			WEIS				1535.8	1536.2	1				IIIG
			WEIS				1555.4	1555.7	2				IIIG
			WEIS				1656.8	1657.2	1				IIIB
			WEIS				1704.8	1707.4	2				IIIG
			WEIS				1753.2	1754.4	3				IIIG,V,U
	2029	2400	CULG				2117						IIIB,W
			CULG				2123	2124.5	1				IIIG
			CULG				2155.5	2157.5					IIIG,W
			CULG				2221	2222					IIIG,W
			CULG				2225.5	2228	1				IIIGG
			CULG	2252	2253	1	2252	2253	1				IIIG
26	0000	0729	CULG	0047	0049	1							I
			CULG				0108	0551					IIIN,W
			CULG				0521	0705					IS,W
			WEIS				0551.0	1726.0	1				IIIN
			CULG				0551	0656					IIIS,W
	0414	1825	WEIS				1616.5	1823.0	1				IN
			WEIS				1751.0	1757.0	3				IIIGG
	2029	2400	CULG				2054	2400	1				IS,DC
			CULG				2057	2400					IIIS,W
			CULG	2157	2400								IN,W
			CULG	2221.5	2223	1	2220.5	2225	2				IIIGG
			CULG				2228	2230	1				IIIGG
			CULG				2305	2306	1				IIIG
			CULG	2344.5	2350	1	2341	2351	2				IIIGG
27	0000	0726	CULG				0000	0726					IIIN,W
			CULG				0000	0136					IS,W
			CULG	0000	0726								IN,W
			CULG				0136	0726					IN,W
			CULG	0300	0300.5	1	0259	0310.5	2				IIIGG
			CULG				0341	0342	1				IIIG
	0414	0610	WEIS				0424.5	1736.0	1				IIIN
			CULG				0457.5	0502.5					IIIGG,W
			CULG	0630.5	0632	1	0630	0646	2				IIIS
	1005	1828	WEIS				1209.5	1214.5	2				IIIGG
			WEIS				1226.6	1232.0	2				IIIG
			WEIS				1344.0	1347.5	2				IIIG
	2030	2400	CULG	2052.5	2400								IN,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
27			CULG				2104	2400	1				IIIN
			CULG				2104	2400					IIIS,W
28	0000	0712	CULG				0000	0118.5					IIIS,W
			CULG	0001	0712								IN,W
			CULG				0015.5	0018	2	0017.5	0018.5	2	UNCLF
			CULG				0026.5	0027.5	1				IIIG
			CULG				0051		1				IIIB
			CULG				0118	0501					IIIN,W
			CULG	0138		1	0138		1				IIIB
			CULG				0332.5		1				IIIB
			CULG				0335.5		1				IIIB
	0414	1451	WEIS				0417.0	1435.0	1				IIIN
			CULG				0501	0645					IIIS,W
			WEIS				1312.5	1323.0	3				IIIGG
	1510	1635	WEIS				1607.2	1608.7	1				IIIG
			WEIS				1627.0	1629.5	2				IIIG
	2030	2400	CULG				2108	2400					IIIS,W
			CULG				2144	2148	1				IS
			CULG	2315.5	2318		2318	2319					IN,W
29	0000	0729	CULG				0000	0606					IIIN,W
			CULG				0525	0527.5	1				IIIGG
	0744	1829	WEIS				1016.2	1019.4	2				IIIG
			WEIS				1023.0	1023.8	1				IIIG
			WEIS				1507.8	1512.8	2				IIIG
	2030	2400	CULG	2056	2056.5								IIIG,W
			CULG				2114.5	2115.5					IIIG,W
			CULG				2135	2259					IIIN,W
			CULG				2239.5	2241					IIIG,W
			CULG	2242	2243.5	2	2242.5	2243	1				IIIGG
			CULG	2247.5	2249	1							IIIG
			CULG	2349.5	2350	1	2349.5	2350.5	2				IIIG
30	0000	0729	CULG				0124	0256					IIIN,W
			CULG	0251.5	0252	1	0251.5	0252.5	2				IIIG,V,U
			CULG				0259	0259.5	1				IIIG
			CULG	0407	0409.5		0407	0409.5					IIIG,W
			CULG	0418	0419.5	1	0419.5		1				IIIGG
	0410	0715	WEIS				0419.2	0419.3	1				IIIB
			WEIS				0551.3	1551.5	2				IIIG
			CULG	0551	0552	1	0551	0552	1				IIIG
			WEIS				0603.3	0605.0	1				IIIG
			CULG	0604	0605	1	0604	0605	1				IIIG
			WEIS				0700.4	0701.3	2				IIIG
			CULG				0701	0702.5	2				IIIG
	0722	1829	WEIS				0803.5	0807.5	2				IIIG
			WEIS				1238.9	1240.1	2				IIIG
			WEIS				1307.0	1310.2	2				IIIG
			WEIS				1344.9	1345.4	1				IIIG
			WEIS				1515.5	1518.7	2				IIIG
	2030	2400	CULG				2117	2319					IN,W,DC
			CULG				2119	2124.5					II? W
			CULG				2136.5	2147.5	1				IIIGG
			CULG				2216						IIIB,W
			CULG	2335.5			2335.5	2336					IIIG,W
31	0000	0730	CULG	0031		1							IIIB
			CULG				0141.5	0144					IIIG,W,DC
			CULG				0148.5	0149.5					IIIG,W
			CULG	0350.5	0351		0350	0351					IIIG,W
			CULG				0632	0643					IIIGG,W
			CULG				0648.5						IIIB,W
	0509	1830	WEIS				0648.5	0648.9	2				IIIG
			WEIS				0831.2	0832.2	1				IIIG
			WEIS				0923.1	0923.2	2				IIIB
			WEIS	1023.0	1215.0	3							IV
			WEIS				1038.5	1040.5	2				IIIG
			WEIS				1040.0	1535.0	3				IV
			WEIS				1040.0	1053.0	3				II

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
31			WEIS				1507.0	1507.4	2				IIIG
			WEIS				1540.0	1600.1	2				I
			WEIS				1629.8	1632.8	2				IIIG
	2030	2400	CULG	2053.5	2212								IS,W
			CULG				2056.5	2102	1				IS
			CULG				2102	2255	1				IS,DC
			CULG				2217	2217.5	1				IIIB,U
			CULG				2220.5	2221.5	1				UNCLF
			CULG				2225	2226					IIIG,W
			CULG	2231.5	2232	1	2231.5	2232	1				IIIG
			CULG				2255	2310					IS,W
			CULG				2310	2400					IN,W
			CULG				2355.5	2357.5.					IIIG,W

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (<10) of bursts
GG = Large group (>10) of bursts
C = Underlying continuum (particularly with Type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

Note: See page 52 of *Solar-Geophysical Data*, Comprehensive Reports, Number 407, for the May 1978 spectral observations from Harvard, Manila and Sagamore Hill. NGSDC must take the blame for failing to include the Manila and Sagamore Hill data with the observations listed here. Those from Harvard, on the other hand, simply arrived too late. The quality of the Culgoora spectrograph film was poor during the period 12/2028 UT to 16/0417 UT. No observations were taken at Durnten from May 24 to May 31, 1978. Retuning of the Dwingeloo radio spectrograph prevented observations from being made during May 1978.

SELECTED SOLAR EVENTS

MAY 1978

Culgoora

UT Date 1978. May	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
30/1	2300	0500	160	.4	0	-	3	IS	
	2300	0500	43.25)				2)		
			80)	.4	0	-	2)	IIIS	
			160)				3)		
2	0116	0121	43.25)						)
			80)	.3	0	-	3	IIIGG,V	) Complex
			160)						) Source
									) Structure
	0118	0410	43.25)						)
			80)	.3	0	-	3	IV	)
			160)						)
									)
	0122	0137	43.25)						)
			80)	.3	0	-	3	II	)
			160)						
	0410	0450	43.25)				3)		Spectral type
			80)	1.1	45	-	3)	II	not easily
			160)				2)		distinguishable.

Days without Heliograph observations: .Nil.....

UT Date 1978. May	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
	2354	2400	43.25)				2)		
			80)	.8	90	-	2)	IIIS	
			160)				1)		
3	0045		43.25)				2)		
			80)	1.1	215	-	3)	IIIG,W	
			160)				1)		
	0253	0257	43.25)				3)		
			80)	.5	0	-	3)	IIIGG	*
			160)				2)		
3/4	2300	0500	43.25	.6)	340	L	2)	IS	Type I persisted from this region until 7th. The 160MHz source double only on 4th.
			80	.7)			3)		
			160	.5)	330	L	2)		
				.7)					
	0025	0500	160)	1.1)	105	L	)	IS	
				1.1)	115	R	2)		
			80	1.2	90	1	)		
			43.25	1.3	75	-	)		

Days without Heliograph observations: .....Nil.....

* Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

MAY 1978

Culgoora

UT Date 1978. May	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
	0457	0504	43.25)	1.4)			3)		
			80)	1.2)	25	-	2)	II, HB	
			160)	1.0)			2)		
4	2257	2302	43.25)	)	335	)	3		
			)	)	270	)			
			80)	1.0)	310	-)	3	IIIGG	*
			)	)	280	)			
			160)		295	)	2		
5	2354	2355	43.25)	1.4					
			80)	1.2	280	-	3	IIIG,V	*
			160)	1.0					
7	0203	0210	43.25)	1.5					
			80)	1.3	270	-	3	IIIGG,V	*
			160)	1.1					
	0323	0442	43.25	1.4	260)			II,HB)	Complex source
			80	1.2	270)	-	3	IV)	
			160	1.0	270)			)	
8	0207	0208	43.25)	1.0)			3)		
			80)	1.0)	290		2)	IIIG	
			160)	.9)			2)		

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

UT Date 1978. May	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
	0210	0221	43.25)	1.0)					
			80)	1.0)	290		3	II	
			160)	.9)					
	0221	0310	43.25	1.3)	275	-	2)	IV	
			80	1.1)	270		3)		
9	0240	0243	80)	1.0	70	-	1	IIIG,W	*This region produced type III's also on the 10th.
			160)				2		
	0356	0357	43.25)	1.3)					
			80)	1.1)	270	-	2	IIIG	*This region produced type III's also on the 10th.
			160)	1.0)					
11	0256	0258	43.25)	.5	80)		3)		)Complex
			80)	.3	40)		2)	IIIGG	)Source
			160)	.4	20)		2)		)Structure.
									)The type IV
	0259	0332	43.25	.3	115)		3	II	)moved from
			80	.1	10)				)position A to B
									)at times
	0315	0328	43.25	A) .4	340)		2	IV	)indicated.
			43.25	B) .3	115)				)

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

MAY 1978

Culgoora

UT Date 1978. May	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
	2329	2333	80)	.7)	0	-	2)	IIIGG	
			160)	.6)			3)		
15	0119	0122	43.25)				3)		
			80)	.9	70	-	2)	IIIG	*This region produced type III's also on 16th.
			160)				2)		
16/17	2300	0500	80)						Type I persisted from this region from 16th to 21st May.
			160)	1.0	45	R	1	I	
	2300	0500	80) 160)	.9	290	L	1	I	
17	0425	0432	80)	1.2	220		2)	II	
			160)	1.1			1)		
18	0506	0507	43.25)	3.0	160		2)	IIIG	
			80)	1.4			1)		
	0516	0518	43.25)	1.0	240		3	II,HB	
			80)						
22	0203	0208	43.25)	1.4					
			80) 160)	1.2 .9	220		3	IIIGG,V,U	*Type III's from this region were observed also on the 23rd.

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

UT Date 1978. May	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
23	0106	0109	43.25)				2)		Spectral type
			80)	1.0	50		2)	II	not easily
			160)				1)		distinguishable.
24	0347	0348	80)	.8	40		2	IIIG,U	*Type III's
			160)				3		from this region were observed also on the 25th.
	2342	2343	80)				1)		
			160)	.8	120	-	2)	IIIGG,W	
25	0334	0336	43.25)	1.2	190	-	2	IIIGG	*
			80)	1.1					
			160)	.9					
	0342	0345	43.25	1.2	190	-	2	UNCLF,SLOW DRIFT.	
26/27	2245	0500	80)	1.0	330)	L	2)	I	
			160)	.6	345)		1)		
	2245	0500	80)	.7	295)	L	2)	I	
			160)	.2	335)		1)		

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

MAY 1978

Culgoora

UT Date 1978. May	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
26/27	2342	2354	43.25)	1.3)	340	-	3)	IIIGG	*
			80)	1.0)	330		3)		
			160)	.6)	345		2)		
28	0026	0027	80)	.2	300		2	IIIG	*
			160)						
30	0252	0253	43.25)	.9)			2)		
			80)	.8)	250		3)	IIIG,V,U	*
			160)	.7)			3)		
30/31	2300	0500	80)	.5	0	R	1	IS	
			160)						

Days without Heliograph observations: Nil.....

* Other type III's observed from same position during the day.

COSMIC RAY INDICES

(Neutron Monitors)

MAY 1978

May 1978	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr	KULA Average cts/hr
1		6425	6115			5554.8		3400.9	
2		6026	5730			5170.1		3310.9	
3		6181	5830			5265.8		3366.5	
4		6333	5982			5457.2		3422.0	
5		6560	6196			5603.4		3457.3	
6		6692	6316			5720.7		3487.1	
7		6933	6489			5897.1		3512.0	
8		6917	6517			5882.5		3531.1	
9		6952	6542			5921.3		3552.8	
10		7056	6649			6004.5		3551.5	
11		7094	6677			6064.7		3569.4	
12		7177	6726			6137.7		3591.4	
13		7181	6775			6163.3		3595.3	
14		7230	6806			6162.9		3600.9	
15		7194	6797			6166.2		3584.1	
16		7216	6807(23)			6147.5		3590.2	
17		7261	6836			6188.2		3595.0	
18		7302	6883			6205.5		3595.5	
19		7280	6868			6216.0		3605.2	
20		7287	6857			6215.7		3600.4	
21		7262	6850			6178.3		3592.3	
22		7218	6823			6203.2		3598.0	
23		7276	6865			6223.7		3600.8	
24		7229	6820			6152.6		3583.6	
25		7251	6835			6157.6		3586.4	
26		7285	6850			6180.8		3594.5	
27		7290	6864			6194.8		3591.2	
28		7320	6902			6215.1		3596.9	
29		7246	6833			6171.2		3587.6	
30		7108	6730			6092.1		3560.9	
31		7074	6654			6031.9		3541.8	
MEAN		7028	6627			5998.3		3546.9	

Data not available at time of publication.

Data not available at time of publication.

Data not available at time of publication.

Data not available at time of publication.

Data not processed at time of publication because of NGSDC paper tape problems.

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

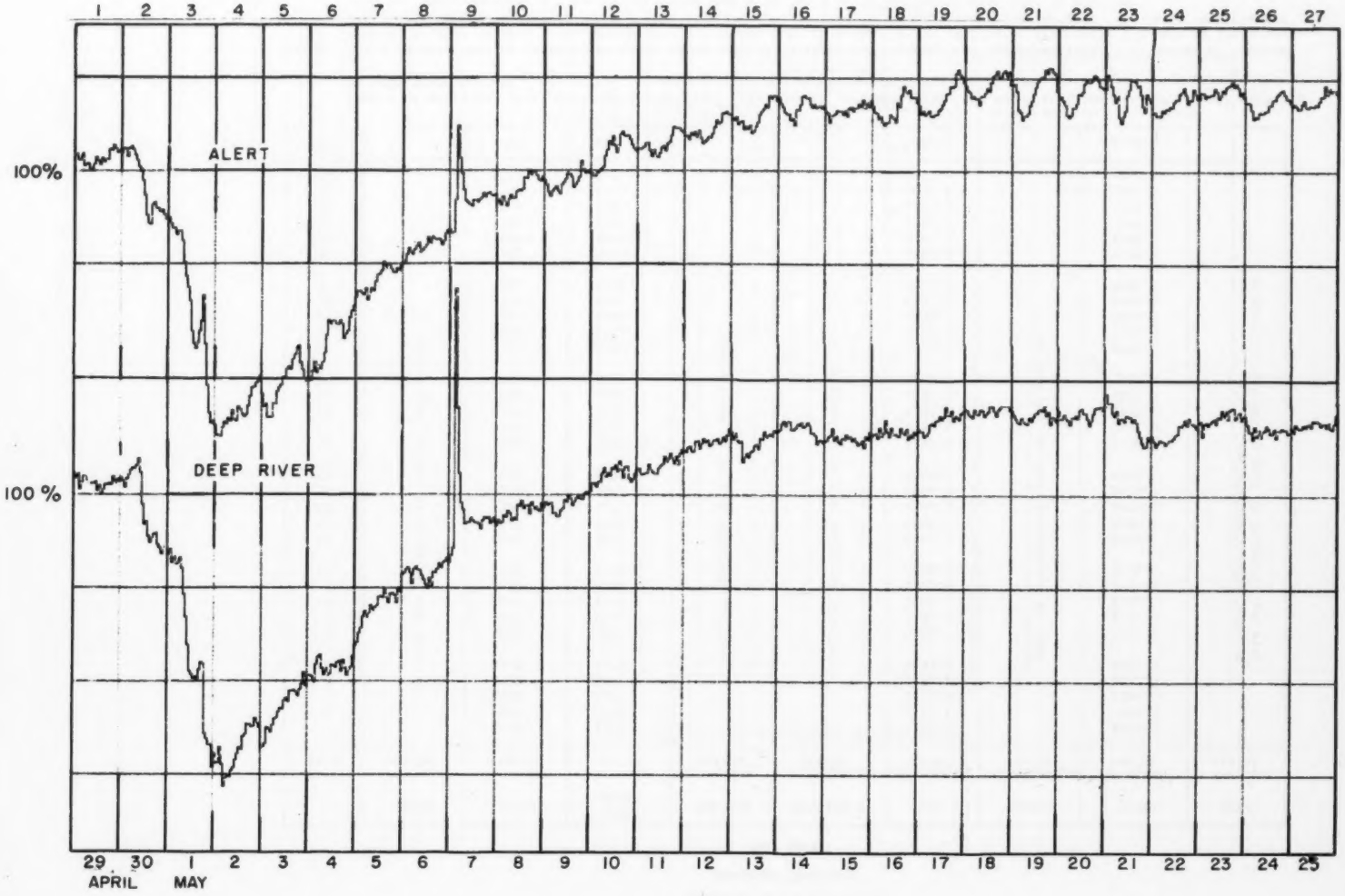
Notes: Tokyo neutron monitor counting rate increased by 2.0/1.5 since the beginning of September 1977. The number of counters changed from 27 to 36. Since the scaling factor has been changed, the listed figures are nearly the same as those in and before May 1977. The level in June, July, and August, 1977 is slightly lower than before. The level in September 1977 has been adjusted, so that direct comparison with the data in and before May, 1977 is possible.

Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100. Deep River Scaling Factor = 300. Tokyo Scaling Factor = 256.

Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967-December 1970 and October 1975 to the present.

COSMIC RAY INDICES
(Neutron Monitors)

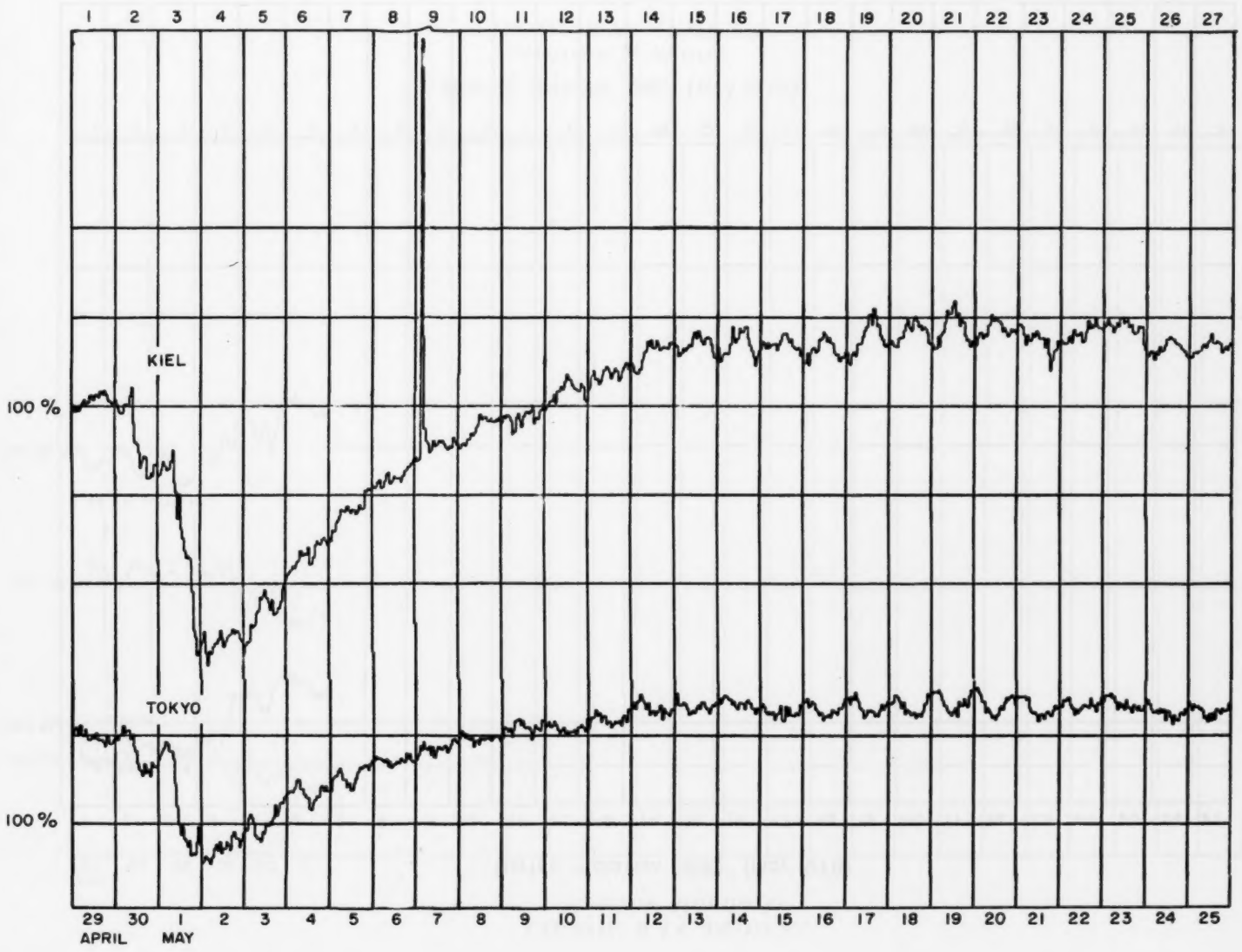
Bartels Rotation 1979 (April - May 1978)



COSMIC RAY INDICES
(Neutron Monitors)

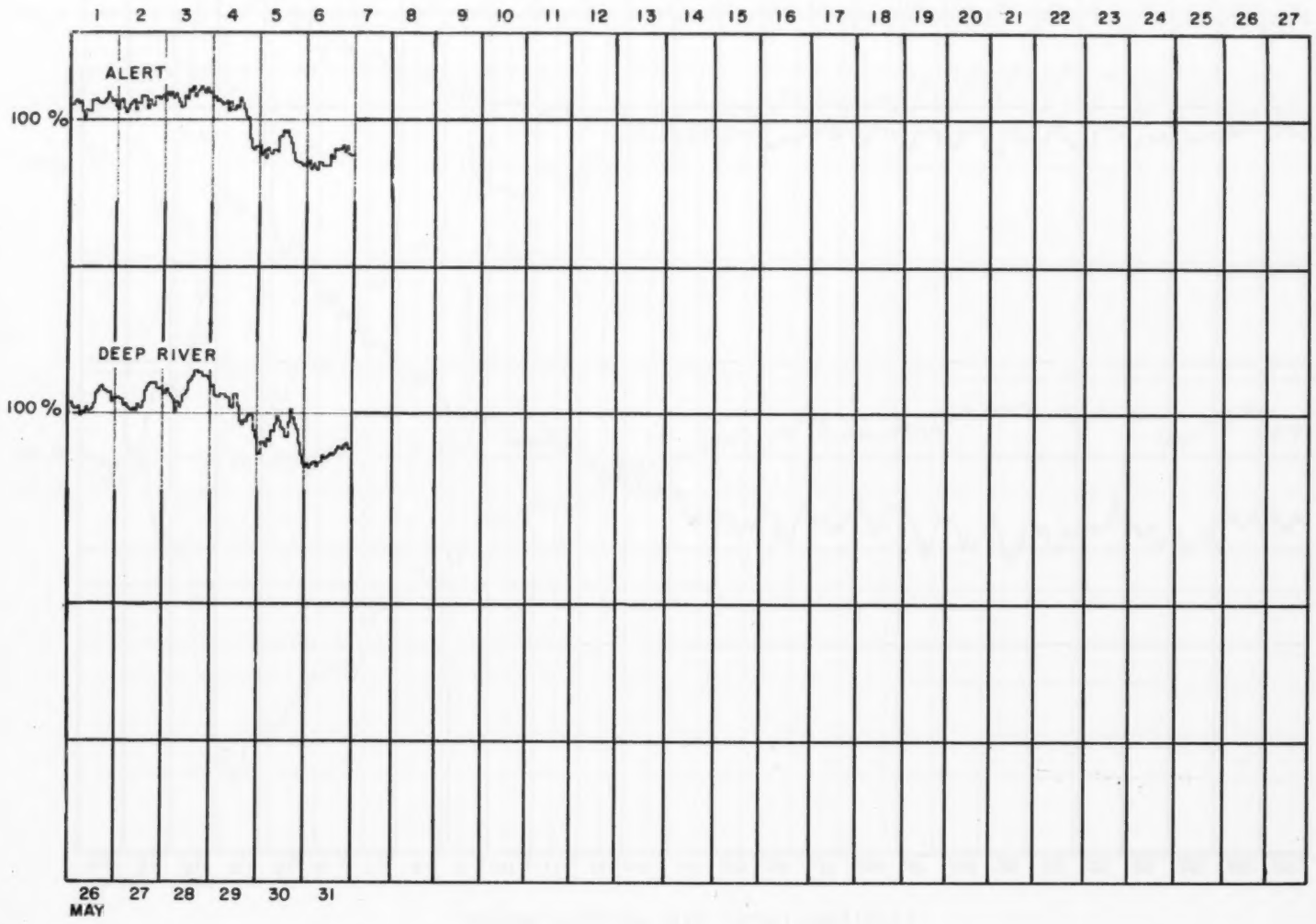
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1979 (April - May 1978)



COSMIC RAY INDICES
(Neutron Monitors)

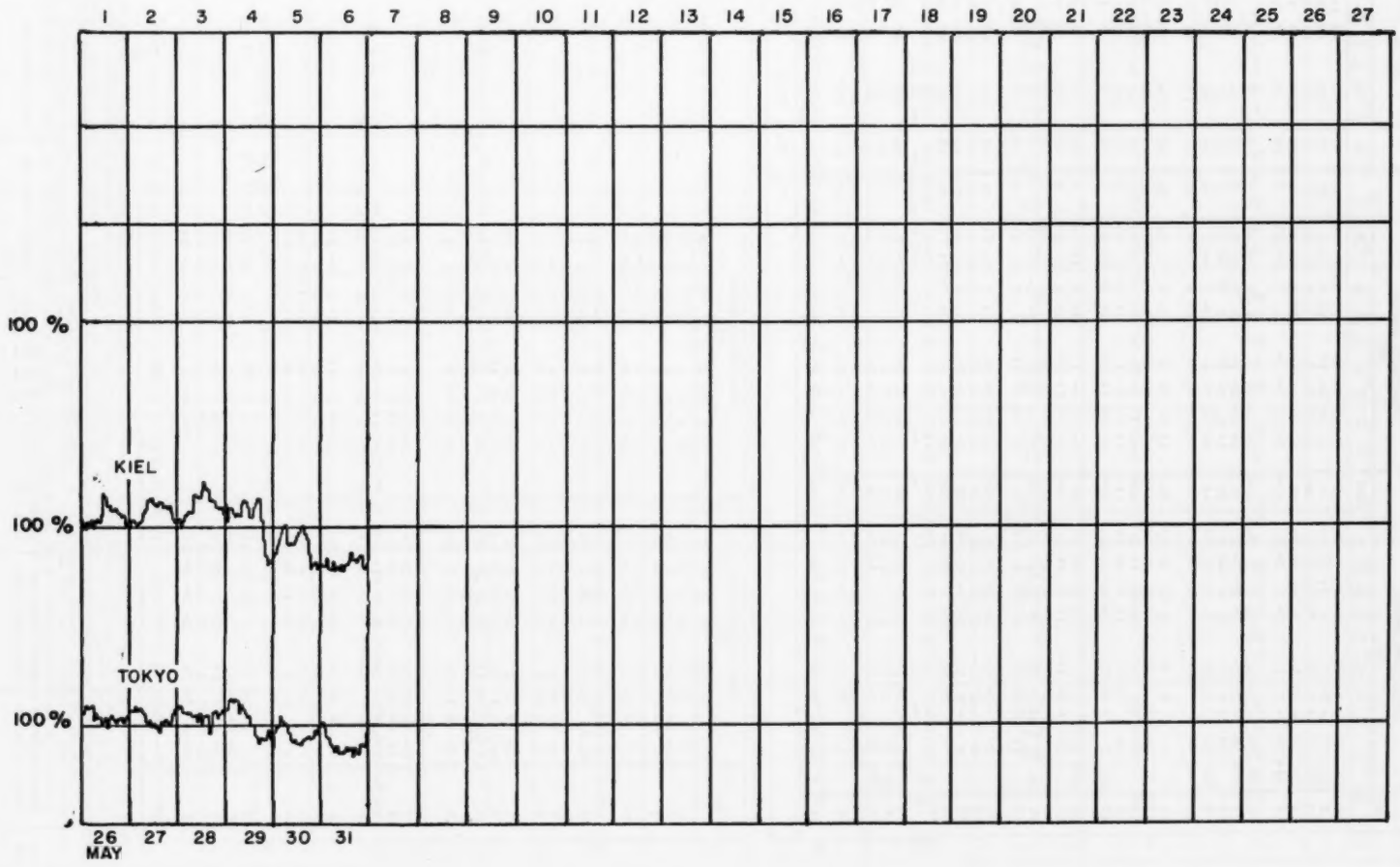
Bartels Rotation 1980 (May 1978)



MAY

COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1980 (May 1978)



GEOMAGNETIC ACTIVITY INDICES

MAY 1978

Day	Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa * *				Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M		
1	D5	3-	5-	6-	5+	7+	4+	7-	8+	45	3-	4	4+	4+	7-	3+	5	7+	88	97	93	48	142		1.8
2	D1	7+	6-	7+	7	7	5+	4-	5-	48	6	5-	6+	6-	5+	4	3+	4	94	85	93	89	89		1.9
3	D4	5-	5+	6	5+	7-	7-	6	7	48-	4-	5-	5-	5	5	5	5	5+	83	85	83	95	72		1.8
4	D2	7+	8-	7+	6+	7-	4+	5-	2-	46	6	7-	6+	6-	5+	3+	4-	2-	96	100	117	164	54		1.9
5	Q0A	1+	2-	1	1	1+	1	2+	4-	13+	1+	1	1-	1-	1	1-	2-	3+	7	15	8	7	17	K	0.4
6	Q4	2-	1	1+	1	1	1	1	3-	11-	1+	1-	1+	1	1	1	1-	2+	5	9	7	8	8	CK	0.2
7	Q9A	3-	1+	2-	2-	1+	2-	3-	2	15	2+	2-	2-	2-	1	2	3-	2	7	15	10	10	15	CC	0.4
8		2-	1+	1	3	3	4	4+	4-	22	1+	1	2-	3-	3	3+	3+	3+	16	29	20	13	36		0.9
9	D3	5	5	8-	6+	7	7-	5	3+	46	4+	4+	7-	6-	6-	5	4+	3	85	85	96	104	77		1.8
10		1-	1+	1-	1-	1+	1-	3+	5-	13+	1-	1+	0+	1-	2-	1	3-	4	10	13	12	4	22	K	0.6
11		4	6	5	3+	3	3	3+	4-	31+	3+	5	4+	3	3-	3	3	3+	30	47	34	50	31		1.3
12		4-	3+	4-	3-	3+	3	4-	3+	27-	4-	3+	3	3-	3	2+	4-	2+	18	33	31	29	35		1.0
13		5-	2-	1	1	2+	2-	1+	3-	16+	4	2-	1	1	2+	1+	1	3-	11	19	11	17	14		0.6
14		3-	2	1+	2	1+	3-	3+	2+	18-	2+	2	2-	2	1+	2+	3	2+	9	20	10	12	19	K	0.5
15	Q5	1	0+	0+	2	1+	2+	2	2	11+	2-	0+	1-	2+	1+	2-	2-	2-	5	13	7	7	14	CC	0.2
16	Q7A	2-	2	1	1	2+	3-	2-	2-	14	2-	1+	1-	1	2-	2	2-	1+	7	15	8	9	15	CC	0.3
17		2-	2+	2+	1+	1+	1+	2+	3	16-	1+	2+	2+	1+	1+	1	2-	3-	8	15	8	9	15	CC	0.4
18	Q3	1+	2	1-	1+	1+	2	1+	0+	10+	1+	2+	0+	1+	1	2	1	0+	5	12	8	9	12	CC	0.2
19	Q1	1	1-	1-	2+	2-	1	0+	1	9-	0+	0+	1-	2	2-	1-	0+	1-	4	9	5	7	7	CC	0.2
20		1+	1+	1+	1+	1	2+	4	1+	14	1	1+	2-	1+	1	2	3	1+	8	19	7	9	18	KK	0.4
21		2	3	2+	1+	3-	2+	6-	6	25+	2+	3+	2+	2-	2+	2	5-	5+	26	43	36	19	61		1.2
22		5	3-	3-	3-	3	4	5-	4	29-	4-	3	3-	2+	3	3+	4-	4-	24	43	27	28	43		1.2
23		3	4-	3	2	2+	4+	4+	5+	28	3-	3	3-	3-	3-	3	4-	4+	24	43	23	22	45		1.1
24		5-	3	4+	4+	5-	3	3-	4-	30+	4+	3	4	4-	3+	3-	2+	4-	26	38	42	44	36		1.2
25		4-	2+	2+	1	2+	1+	2	3+	18+	4	3-	2+	1+	2+	2-	2-	3	10	20	17	18	20		0.6
26	Q8A	3	2-	2-	2-	2-	2-	2-	1	14	3	2-	2	2+	2	1+	2-	1	7	14	18	17	15		0.3
27	Q2	1+	1	2-	1+	1	1-	1-	2+	10	1+	1+	2	1	1-	1-	1-	2+	5	12	4	8	9	CC	0.2
28	Q6A	2-	1	1+	2-	2	2	3-	2-	14	2-	1+	1+	3-	2	2	2+	1+	7	17	16	11	22	K	0.3
29		1+	1-	0+	1	1+	1	4-	3+	13-	1+	1-	1-	1	1+	1	3	3	8	17	11	6	22		0.4
30		5	4	4-	2-	3-	2+	3-	2+	24+	5-	3+	4-	2	2+	2	2+	2	18	30	21	28	24		1.0
31		4	4	2+	1+	3-	1	1+	1	18-	3+	3+	2+	2	2+	1+	1+	1	12	20	13	24	9		0.7
																			25	33.4	29.0	31.3			0.81

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	3-	4	5-	5-	6+	4-	5+	7	2+	4	4	4	7-	3	5	8-
2	6+	5-	7-	6-	6-	4	3	4-	6	5-	6	6	5	4	3+	4+
3	4	5-	5	5-	5	5+	5-	6-	4-	4+	5-	5	5+	5-	5	5+
4	6-	7-	7-	6-	6-	4-	4-	2-	6	6+	6	6-	5-	3+	3+	1+
5	1	1+	1+	1	1+	1+	2+	3	1+	1	0+	0+	0+	0+	1+	4-
6	2-	1	2-	1+	2-	1+	1+	2+	1	1-	1+	1-	0+	0+	0	2
7	3-	2	2-	2+	1+	2+	3	3-	2+	1+	1+	1	1-	1+	2	1
8	2-	1	2-	3	3	4-	4-	3+	1+	1+	1+	2+	3	3+	3	3
9	5-	5-	7-	6-	6-	5+	4+	3	4	4	6+	6	6-	5	4+	3
10	1	1+	0+	1	2-	1-	3	4+	1-	1+	0+	0+	1+	1	2+	4
11	4-	5+	4+	3	3-	3	3	3	3+	5	4+	3	3-	3	3	3+
12	4-	3+	3	3-	3+	2+	3+	3-	4-	3+	3+	2+	3	2+	4-	2
13	4-	2-	1+	1+	3-	2-	2-	3-	4+	1+	1-	1	2-	1+	0+	2+
14	3-	2	2-	2+	1+	3-	3	3-	2+	2	1+	2-	1	2-	3	2+
15	2-	0+	1	3-	2-	2	2	2+	1+	0+	0+	2-	1+	1	1	1
16	2-	2-	1+	1+	2+	3-	2	2	1+	1+	0+	1-	1+	2-	1+	1-
17	2-	3-	2+	2-	2-	1+	2+	3-	1-	2	2+	1	1	1	1	3
18	1+	2+	1-	2-	1+	2+	1+	1-	1+	2+	0	1	1-	2-	1-	0
19	1-	0+	1-	2+	2	1	1-	1+	0+	0+	1-	2-	1+	0	0+	0
20	1	2-	2	2-	2-	3-	3+	1+	1-	1	1+	1-	0	1	3-	1
21	3-	3+	3-	2+	3-	3-	5	5-	2	4-	2	1+	2-	1	5-	6-
22	4	3	3-	3-	3	3+	3+	3	4-	3	3-	2+	3-	3+	4	4
23	3-	3	3-	3-	3-	4-	4	5-	3-	3	3	3-	3-	3-	3	4+
24	4	3	4	4	4-	3	3-	3+	5-	3+	4+	4-	3+	3-	2-	4+
25	3+	3-	3-	2-	2+	2-	2	3-	5-	3-	2	1+	2+	1+	1+	3
26	3	2-	2-	2	2	2-	2-	1+	3	2-	2	2+	2	1	2-	1-
27	1+	1+	2+	1+	1+	1-	1	2-	1+	1+	2	1	0	0+	0+	3-
28	2-	1+	2	2+	2+	2	2+	1+	2-	1+	1	3-	2-	2-	2+	1+
29	1	1	1	1	2-	1+	3+	3	2-	0+	0	1-	1+	0+	2+	3-
30	5-	3	3+	2+	2+	2+	3-	2+	5	4-	4-	2	2+	2-	2-	1+
31	4-	4-	2+	3-	3-	2-	2	1+	3	3+	2+	1+	2-	0+	1-	0+

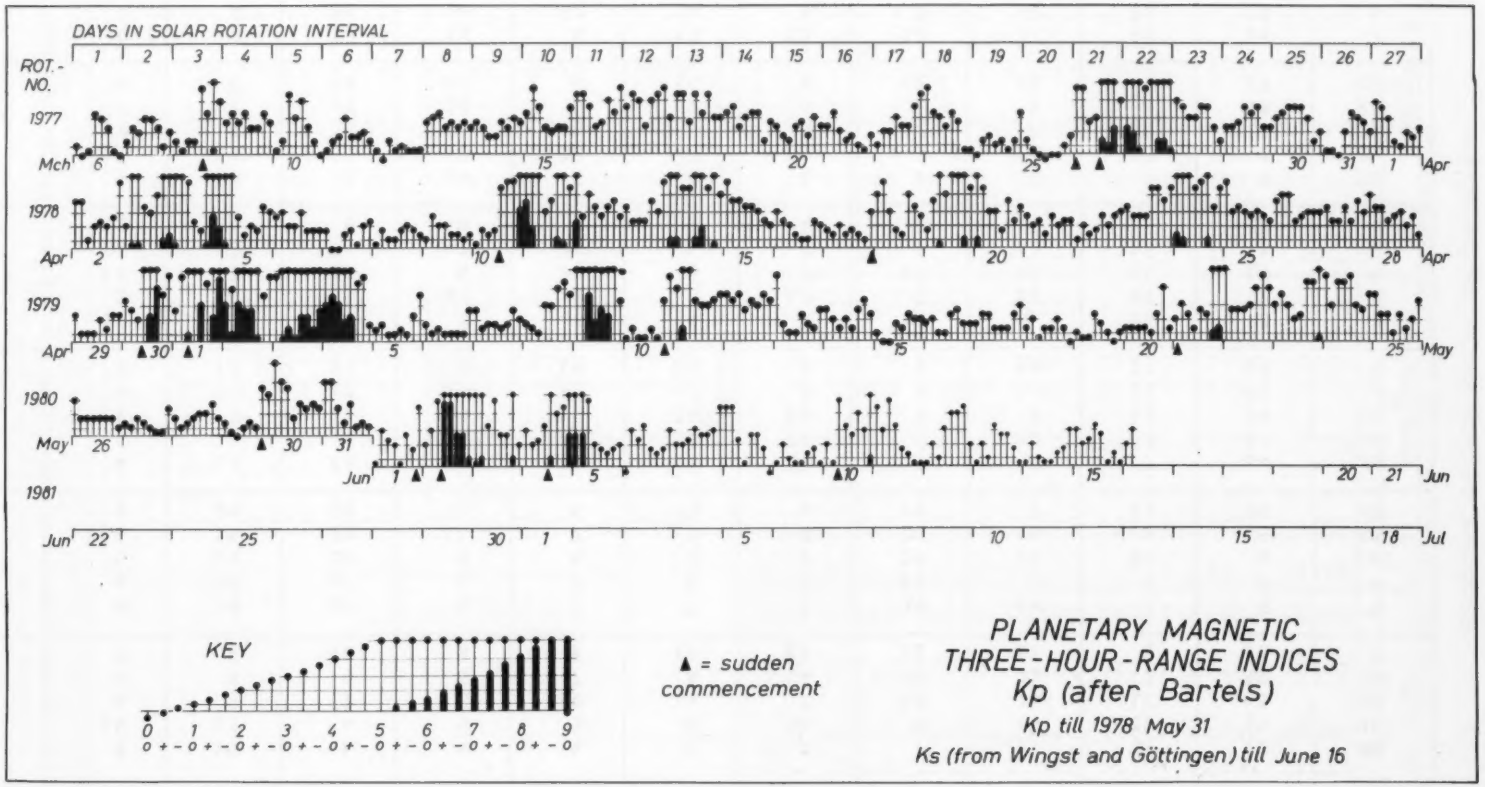
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q0(10)] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap ≤6 but one Kp ≥3o or two Kp values ≥3-"). An * means "not really disturbed" (Ap<20).

Geomagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

DAILY AVERAGE INDICES Ap

	1977							1978				
DAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	9	15	6	4	4	5	6	7	15	33	12	88
2	14	11	4	6	5	6	69	8	14	27	15	94
3	6	9	7	8	10	4	9	13	14	15	41	83
4	5	8	9	6	7	8	14	89	11	3	55	96
5	7	5	40	3	8	10	18	31	17	6	21	7
6	5	28	21	4	8	7	5	34	14	7	9	5
7	6	15	17	6	3	5	3	13	7	9	5	7
8	6	14	12	8	6	3	2	19	10	20	5	16
9	6	16	20	11	2	3	3	23	16	14	6	85
10	8	14	12	13	4	9	4	21	7	12	36	10
11	4	10	28	19	12	6	38	7	5	7	64	30
12	4	4	11	6	28	18	21	4	10	3	29	18
13	6	9	11	28	14	26	16	8	8	12	24	11
14	9	18	12	10	13	42	8	3	11	10	51	9
15	3	12	11	9	19	25	5	2	48	17	19	5
16	10	27	9	7	8	14	9	14	11	24	8	7
17	8	14	29	10	12	8	12	9	10	25	7	8
18	10	7	13	6	22	6	3	12	10	24	19	5
19	10	23	24	42	28	6	3	6	12	15	38	4
20	11	29	8	44	7	4	4	3	12	9	23	8
21	6	10	5	64	5	5	6	1	12	7	9	26
22	10	11	5	63	22	3	6	3	22	13	8	24
23	10	6	6	21	6	2	4	2	6	15	22	24
24	7	7	10	12	6	2	5	6	5	6	48	26
25	5	5	27	10	4	15	5	12	12	3	17	10
26	6	3	13	18	6	19	11	12	37	49	18	7
27	7	3	14	24	62	12	6	5	42	70	16	5
28	12	4	7	9	47	5	10	9	46	17	12	7
29	7	61	6	3	9	6	8	36		14	6	8
30	9	17	5	4	9	12	5	36		16	58	18
31		8	4		6		6	23		8		12
MEAN	8	14	13	16	13	10	10	15	16	16	23	25

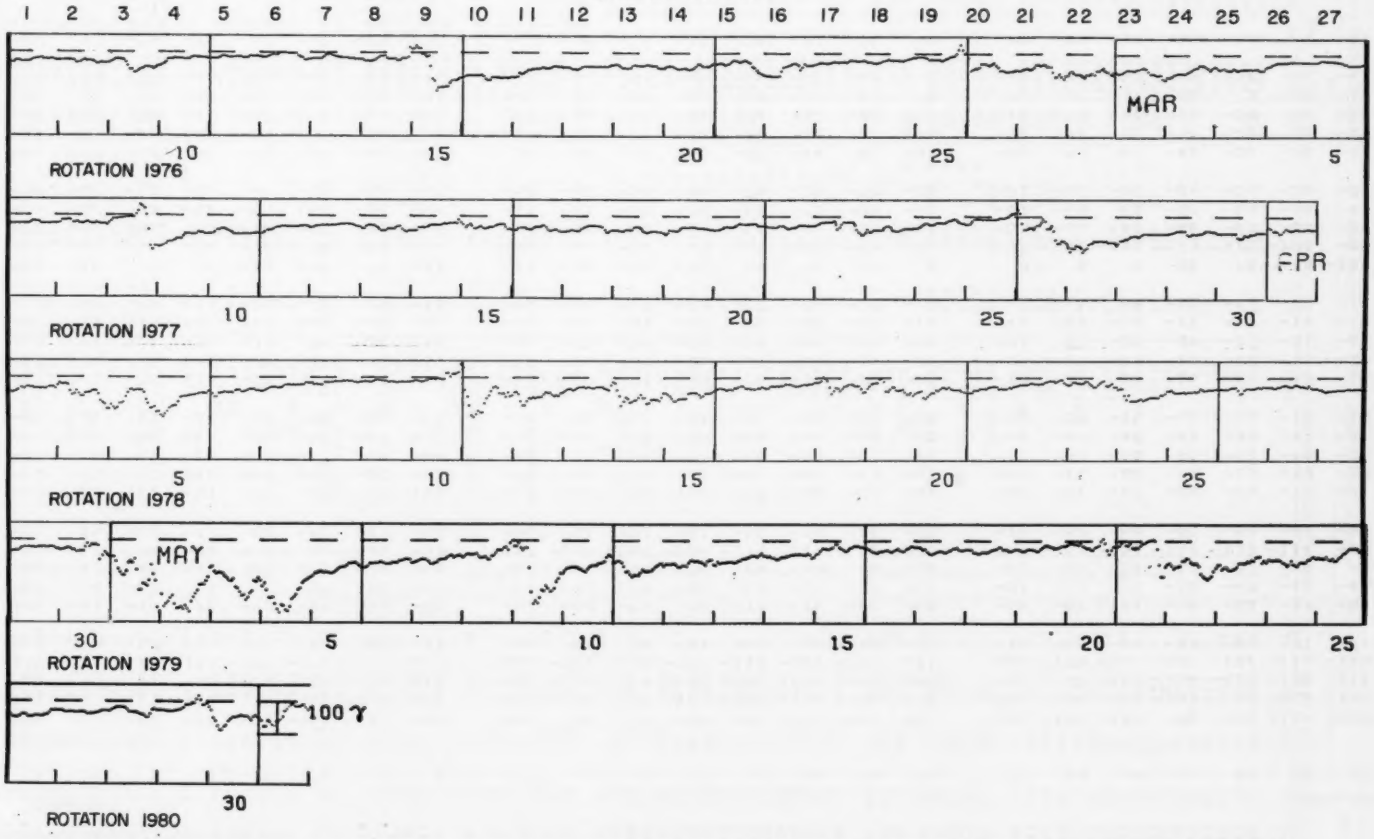
GEOMAGNETIC ACTIVITY INDICES



GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst

by Bartels Rotation



Note: Both the sensitivity indicator placed on the last day of the month and the zero reference level change from month to month.

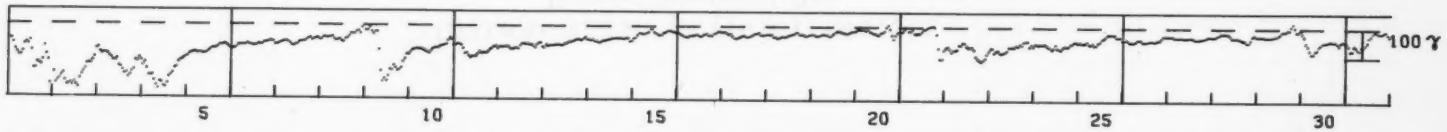
HOURLY EQUATORIAL Dst VALUES (PROVISIONAL

MAY 1978

NASA/GODDARD SPACE FLIGHT CENTER

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-52	-53	-66	-88	-98	-108	-107	-95	-70	-65	-70	-58	-92	-154	-151	-132	-135	-135	-122	-76	-105	-124	-205	-217
2	-163	-202	-193	-187	-175	-167	-194	-208	-205	-201	-209	-198	-207	-216	-186	-172	-162	-152	-135	-133	-133	-123	-112	-83
3	-80	-96	-101	-98	-100	-102	-110	-115	-123	-125	-118	-142	-146	-158	-168	-165	-162	-173	-160	-154	-122	-126	-114	-122
4	-139	-130	-151	-174	-175	-171	-192	-209	-216	-194	-198	-212	-214	-200	-177	-171	-163	-148	-144	-128	-122	-118	-113	-110
5	-107	-95	-97	-94	-93	-97	-95	-97	-99	-98	-96	-91	-86	-81	-80	-80	-76	-69	-68	-67	-65	-71	-77	-82
6	-84	-81	-78	-70	-70	-68	-68	-69	-64	-68	-70	-72	-71	-70	-66	-68	-68	-62	-61	-59	-56	-57	-59	-67
7	-67	-64	-62	-59	-56	-57	-60	-64	-70	-72	-68	-66	-60	-57	-58	-56	-51	-47	-44	-52	-49	-46	-44	-50
8	-50	-43	-40	-44	-42	-41	-39	-48	-53	-51	-49	-56	-59	-48	-45	-38	-30	-30	-29	-22	-20	-29	-8	-1
9	-18	-17	-9	-23	-30	-23	-23	-85	-157	-191	-182	-188	-171	-148	-152	-136	-144	-154	-151	-144	-123	-114	-98	-99
10	-91	-84	-82	-80	-80	-80	-82	-85	-88	-92	-95	-87	-80	-76	-76	-75	-70	-68	-66	-63	-50	-43	-48	-67
11	-65	-62	-63	-67	-79	-95	-93	-102	-110	-105	-105	-106	-97	-88	-93	-92	-92	-91	-87	-80	-75	-70	-71	-79
12	-72	-72	-72	-70	-69	-74	-80	-80	-76	-75	-78	-67	-61	-61	-63	-61	-64	-64	-68	-74	-63	-59	-58	-72
13	-75	-64	-69	-66	-66	-67	-64	-64	-65	-67	-65	-61	-60	-55	-56	-52	-50	-46	-45	-46	-49	-44	-38	-46
14	-46	-49	-46	-52	-51	-56	-57	-51	-49	-50	-46	-45	-42	-41	-40	-40	-42	-42	-42	-44	-39	-42	-51	-49
15	-41	-38	-31	-24	-23	-26	-25	-22	-19	-10	-11	-20	-24	-28	-32	-29	-22	-19	-15	-16	-16	-19	-19	-23
16	-23	-26	-31	-35	-37	-38	-33	-32	-31	-29	-28	-33	-36	-31	-28	-24	-30	-33	-33	-26	-23	-18	-16	-20
17	-19	-15	-23	-28	-26	-34	-39	-42	-39	-36	-33	-31	-34	-37	-35	-32	-29	-24	-23	-20	-28	-31	-29	-27
18	-28	-27	-29	-36	-37	-39	-38	-35	-36	-37	-34	-30	-27	-26	-24	-19	-21	-27	-26	-28	-33	-31	-28	-26
19	-26	-28	-32	-32	-29	-26	-25	-28	-29	-32	-31	-25	-20	-14	-13	-16	-19	-20	-23	-21	-19	-15	-15	-14
20	-12	-5	-9	-11	-11	-13	-9	-15	-19	-22	-22	-27	-27	-20	-17	-13	-1	6	-8	-28	-41	-28	-18	-18
21	-18	-14	-7	-1	-13	-15	-9	-21	-24	-20	-22	-14	-8	-6	-2	2	3	5	0	-25	-72	-108	-109	-77
22	-69	-66	-74	-84	-78	-79	-75	-60	-60	-52	-54	-63	-68	-68	-66	-76	-99	-106	-111	-115	-111	-105	-89	-80
23	-71	-70	-86	-80	-78	-86	-88	-85	-63	-77	-66	-67	-67	-65	-61	-63	-56	-60	-49	-46	-47	-65	-59	-64
24	-56	-58	-60	-56	-57	-56	-60	-64	-67	-73	-69	-58	-69	-72	-75	-66	-62	-64	-63	-56	-54	-48	-47	-52
25	-49	-52	-53	-53	-47	-55	-58	-53	-60	-58	-50	-46	-38	-35	-30	-23	-21	-22	-21	-24	-31	-33	-33	-42
26	-44	-38	-43	-48	-48	-50	-46	-40	-38	-42	-47	-48	-47	-44	-43	-43	-46	-46	-41	-40	-35	-28	-27	-28
27	-29	-25	-28	-32	-34	-32	-32	-32	-35	-35	-33	-32	-32	-35	-38	-38	-37	-37	-35	-34	-32	-28	-29	-29
28	-30	-28	-24	-21	-17	-16	-18	-16	-20	-25	-33	-34	-34	-33	-36	-38	-41	-42	-48	-48	-38	-26	-22	-27
29	-29	-26	-29	-29	-31	-31	-30	-31	-28	-26	-25	-22	-18	-11	-11	-9	-4	-6	7	16	3	-12	-12	-6
30	-16	-28	-50	-60	-75	-86	-86	-76	-71	-60	-54	-49	-46	-47	-44	-41	-44	-45	-43	-49	-57	-46	-41	-47
31	-49	-57	-75	-78	-57	-61	-70	-72	-60	-58	-54	-44	-28	-23	-14	-9	-9	-13	-15	-13	-10	-8	-17	-25



Note: Both the sensitivity indicator placed on the last day of the month and the zero reference level change from month to month. Hourly values of the provisional Dst index for May 1978 are based on data from Hermanus, Kakioka and San Juan; the magnetometer at Honolulu was not operating for about 1 month.

PRINCIPAL MAGNETIC STORMS

MAY 1978

OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
FR	49.6N	30	0952	SC	- 5	+36	- 7	01(8)	8	54	575	565	04	21
WI	54.2N	1	0828	SC*	- 2 *	-45 *	0	01(8)	8	65	360	295	04	20
SJ	29.9N	1	1836	SC	- .5	+19	+ 5	01(8)	7	12	184	36	02	15
GM	24.5N	1	0800	..	..	..	..	--	-	11	215	67	04	23
JP	17.3N	1	0800	..	..	..	..	--	-	9	190	45	04	23
SH	14.6N	1	0800	..	..	..	..	--	-	8	233	52	04	23
UJ	13.5N	1	0800	..	..	..	..	--	-	6	212	45	04	23
AL	09.5N	1	0800	..	..	..	..	01(5)	7	7	191	51	04	23
HD	07.6N	1	0826	SC	- .2	+17	- 1	01(5)	7	6	229	20	01	18
HD	07.6N	1	1835	SC	- .5	+44	- 2	01(7,8) 02(3,4,5)	6	6	177	39	02	19
GU	04.0N	1	0828	SC	..	+17	- 5	01(5)	6	--	120	20	01	18
GU	04.0N	1	1836	SC	..	+32	- 9	01(8)	7	10	200	50	04	19
AN	01.5N	1	0800	..	..	..	..	--	-	7	246	130	04	23
HU	00.6S	1	0828	SC	+ 1	+28	+ 6	01(5,8)	7	12	459	70	02	21
TV	01.1S	1	0800	..	..	..	..	--	-	4	262	182	04	23
GN	43.3S	1	1836	SC	+ 6.8	+30	+36	01(8)	8	52	200	210	02	20
GN	43.3S	1	0829	SC*	+ 1.3	+16 *	+ 6	01(5)	7	22	80	180	01	18
KG	56.5S	1	0828	SC*	--	--	--	01(5,8)	9	--	--	--	04	21
IR	41.0N	2	2328	SC	- 2.6	+19	+ 3	03(8) 04(3,5)	6	32	246	127	04	21
SJ	29.9N	2	2324	SC	+ 1	+15	+ 5	04(2)	6	12	99	29	04	19
HD	07.6N	2	2317	SC	+ .3	+23	- 1	03(4,5) 04(2,3)	6	5	181	29	04	21
HU	00.6S	2	2318	SC	+ 1	+22	+ 3	03(6)	6	10	287	42	04	20
GN	43.3S	2	2319	SC	+ 5.2	+13	+25	03(5) 04(1,4,5)	6	21	180	180	04	21
NE	55.1N	7	2154	SC*	+ 2	+22	..	09(3,4,5)	7	62	434	503	09	04
FR	49.6N	7	21--	..	..	..	..	09(3)	7	50	280	190	10	00
HU	00.6S	7	2156	SC	--	+16	+ 2	09(3,5,6)	6	11	395	50	09	23
CO	64.6N	8	10--	..	..	..	..	09(3)	8	274	1670	1160	10	04
SI	60.0N	8	11--	..	..	..	..	09(5)	8	160	--	770	09	23
WI	54.2N	8	13--	..	..	..	..	09(3)	7	38	260	130	09	23
IR	41.0N	8	0500	..	..	..	..	09(3)	8	36	198	114	09	23
SJ	29.9N	8	1200	..	..	..	..	09(3)	7	11	168	42	10	00
GM	24.5N	8	1300	..	..	..	..	--	-	9	229	82	10	03
JP	17.3N	8	1300	..	..	..	..	--	-	9	234	58	10	03
SH	14.6N	8	1300	..	..	..	..	--	-	8	294	45	10	03
UJ	13.5N	8	1300	..	..	..	..	--	-	7	259	49	10	03
AL	09.5N	8	1300	..	..	..	..	09(3)	7	8	237	55	10	03
HD	07.6N	8	1300	..	..	..	..	09(3)	8	7	282	36	10	01
GU	04.0N	8	1303	..	..	..	..	09(3)	7	10	320	30	09	23
AN	01.5N	8	1300	..	..	..	..	--	-	7	372	168	10	03
TV	01.1S	8	1300	..	..	..	..	--	-	4	--	--	10	03
GN	43.3S	8	11--	..	..	..	..	09(6)	7	34	200	210	10	00
TO	46.7S	8	11--	..	..	..	..	09(3,4,5)	6	47	234	119	09	23
KG	56.5S	8	1713	SC*	--	--	--	09(5,6)	7	--	--	--	09	21
CO	64.6N	10	2004	SC*	- 4	+14	- 6	12(3)	7	149	1010	650	13	04
SI	60.0N	10	20--	..	..	..	..	11(2)	7	--	440	400	12	15
NE	55.1N	10	2005	SC*	+ 1	+22	--	11(2,3)	6	41	190	200	13	05
FR	49.6N	10	2005	SC	- 1	+23	- 3	10(8) 11(2) 12(1)	5	18	100	76	12	06
HD	07.6N	10	2002	SC	- .2	+ 8	- 1	10(8)	4	5	66	28	11	22
KG	56.5S	10	20--	..	..	..	..	11(2)	5	--	--	--	11	10
FR	49.6N	20	17--	..	..	..	..	21(7,8) 23(7,8) 24(3,4)	5	24	180	98	25	03
GM	24.5N	20	1600	..	..	..	..	--	-	--	--	--	--	--
JP	17.3N	20	1600	..	..	..	..	--	-	9	127	53	23	03
SH	14.6N	20	1600	..	..	..	..	--	-	8	129	35	23	03
UJ	13.5N	20	1600	..	..	..	..	--	-	8	143	47	23	03
AL	09.5N	20	1600	..	..	..	..	21(7,8)	5	8	140	50	23	03
TV	01.1S	20	1600	..	..	..	..	--	-	5	190	78	23	03
CO	64.6N	21	18--	..	..	..	..	22(6,7) 24(3,4,5)	6	208	1140	660	24	15
NE	55.1N	21	0243	SC	+ 1	+18	--	21(8) 22(1) 23(8) 24(3)	5	30	177	168	25	09
WI	54.2N	21	0241	SC*	+ 1 *	+ 6	0	21(7,8) 24(1)	6	35	190	85	24	17
SJ	29.9N	21	0241	SC	..	+11	+ 2	21(7)	6	12	126	27	22	12
HD	07.6N	21	0240	SC	+ .1	+21	- 2	21(8)	6	7	162	26	22	23
GU	04.0N	21	0242	..	..	..	..	21(7)	5	10	100	30	22	03
HU	00.6S	21	0241	SC	--	+15	+ 3	21(7,8)	6	6	303	40	22	23
TO	46.7S	21	19--	..	..	..	..	21(7,8)	5	35	148	31	24	18
KG	56.5S	22	11--	..	..	..	..	22(7)	6	--	--	--	23	00
NE	55.1N	29	1831	SC*	+ 4	+18	--	30(1,3) 31(1)	5	27	173	174	31	12
FR	49.6N	29	1831	SC	- 1	+25	- 4	29(1) 31(2)	5	17	105	39	31	15
GM	24.5N	29	1830	SC	- .3	+31	+ 6	--	-	8	95	32	31	03
JP	17.3N	29	1830	SC	- .5	+27	- 4	--	-	7	81	37	31	03
SH	14.6N	29	1830	SC	+ .3	+25	+ 3	--	-	8	100	27	31	03
UJ	13.5N	29	1830	SC	- .3	+33	- 7	--	-	6	96	35	31	03
AL	09.5N	29	1830	SC	- .4	+23	- 3	29(7) 30(1)	4	5	63	32	31	03
HD	07.6N	29	1830	SC	- .2	+26	- 1	30(1)	5	6	79	26	31	16
GU	04.0N	29	1831	SC	..	+17	- 5	30(1)	6	10	110	40	30	08
HU	00.6S	29	1830	SC*	+ 1	+62	+ 7	30(1,2)	5	4	285	21	31	08
TV	01.1S	29	1830	SC	+ .1	+20	+28	--	-	3	127	73	31	03
KG	56.5S	29	1834	SC	--	--	--	30(1)	5	--	--	--	30	12

Note: Both the sensitivity indicator placed on the last day of the month and the zero reference level change from month to month. Hourly values of the provisional Dst index for May 1978 are based on data from Hermanus, Kakioka and San Juan; the magnetometer at Honolulu was not operating for about 1 month.

Reports were received from the following observatories:

Alibag Annamalainagar College Fredericksburg Gulmarg Gnangara Guam Huancayo Hyderabad Irkutsk Jaipur Kerguelen Newport Shillong San Juan Sitka Toolangi Trivandrum Trjjain Witteveen

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

MAY 1978

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romaná).

The meaning of the station symbols is given in the IAGA-News No. 16.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc).

01	0828	A: COI QUE LAS TRW CZT PAF B: WNG WIT AQU KAK HUA DRV C: MMB EBR KNY (si: A: FUR - bps: A: LMN)
01	1835	A: EBR COI KAK QUE SZT HUA LMN LAS B: WIT DOU MMB AQU KNY C: NGK (si: A: FUR)
02	2318	A: AQU EBR COI QUE HUA B: WIT KNY SZT C: NGK KAK (si: A: FUR TOL: B: LMN - bs: A: KSA)
07	2155	A: HUA B: SOD SZT C: VIC AQU (si: A: OTT; B: EBR; C: TOL? - b: A: LMN)
10	2005	A: OTT COI TOL FRD HUA LAS TRW B: SOD NUR ESK WNG WIT DOU VIC AQU KSA QUE DRV C: HAD MMB EBR KAK LMN (si: A: FUR)
21	0241	B: QUE SZT HUA C: WNG WIT MMB AQU TOL (bps: C: EBR)
29	1831	A: SOD ESK WNG WIT DOU VIC FUR EBR COI TOL FRD HUA LMN LAS TRW PAF B: NUR HAD OTT AQU KAK QUE CZT C: NGK MMB (bs: A: KSA)

Solar-flare effects (sfe).

Effects confirmed by ionospheric or solar observations are underlined.

05	1027 - 1036	WNG
06	2015 - 2025	HUA
07	0324 - 0505	MMB KAK KNY
07	1550 - 1618	HUA
23	0020 - 0105	KNY
26	1748 - 1803	HUA

Very unusual events.

01 1237 bp PAF (+926 +574 +380) DRV (-1000 -869 -1600)

RADIO PROPAGATION QUALITY INDICES

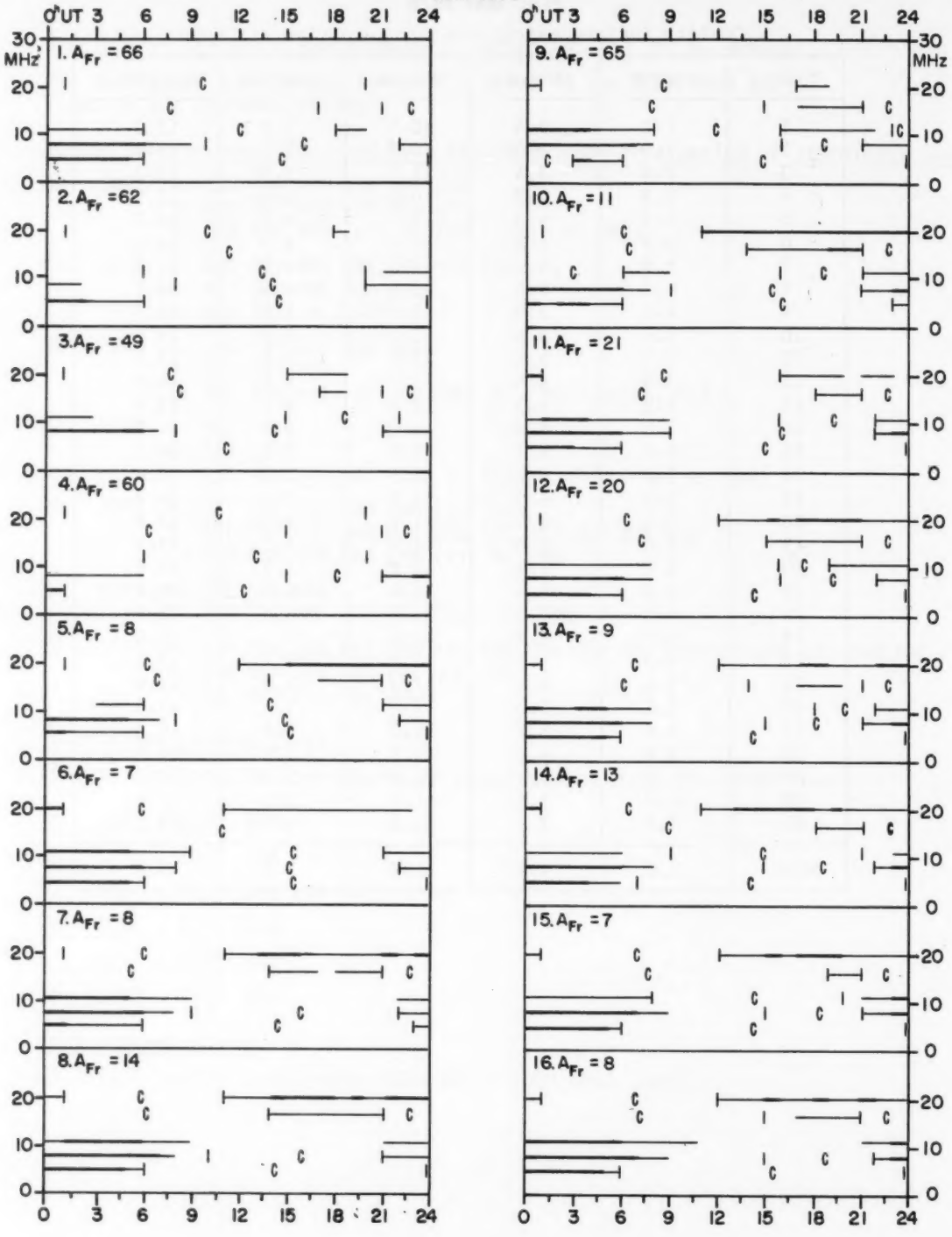
MAY 1978

Quality indices calculated for reception at Lüchow

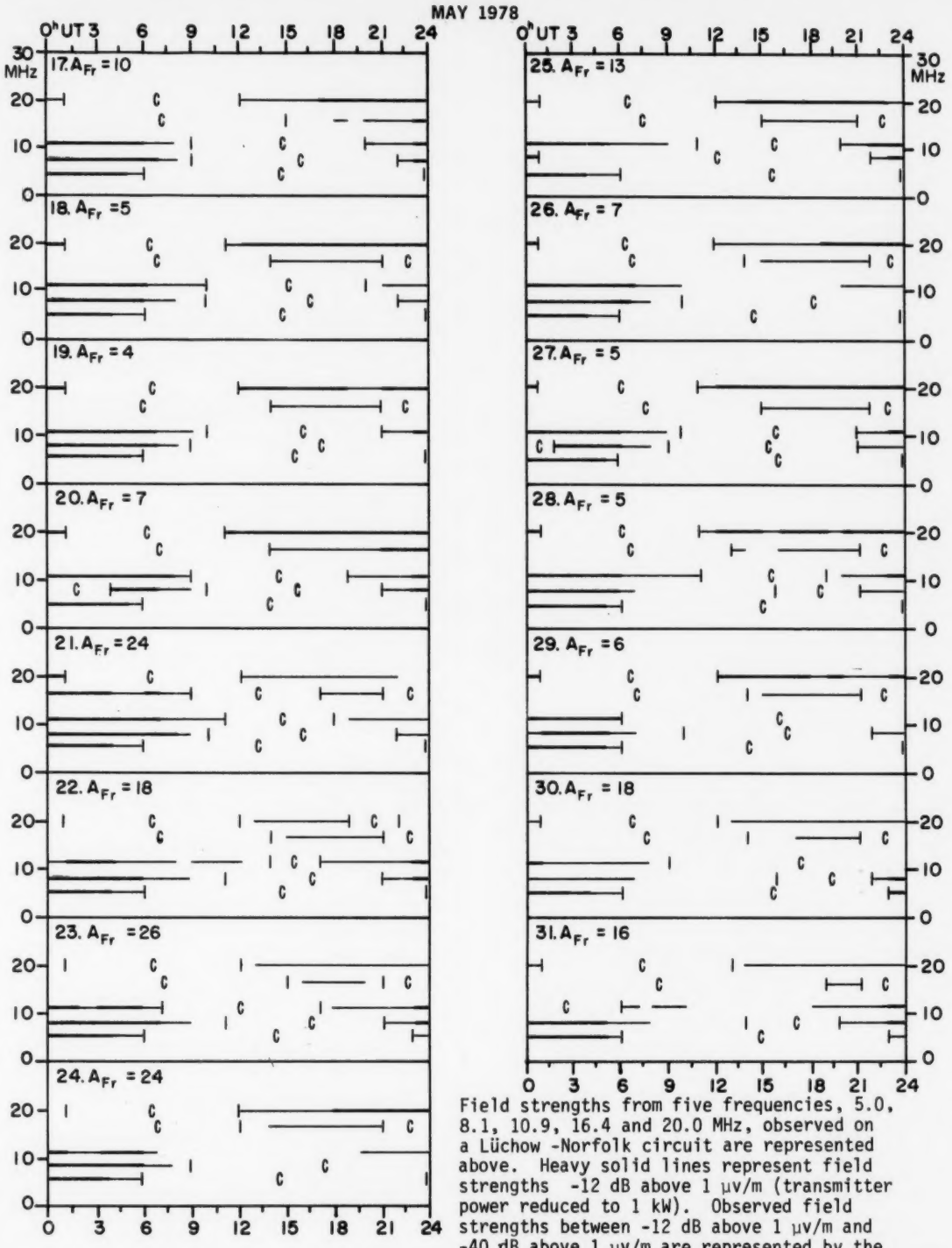
DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	2.1	3.4	10.5	2.2	12.3
2	2.0	3.5	10.7	3.1	11.8
3	2.4	3.4	11.1	3.8	13.3
4	2.3	3.2	10.3	4.9	12.3
5	4.4	4.8	11.7	4.9	14.7
6	5.8	4.2	12.2	4.3	14.2
7	6.0	4.7	11.5	4.8	14.8
8	6.3	4.6	12.2	4.8	13.7
9	4.1	3.9	11.6	5.0	12.7
10	6.6	5.1	12.1	5.0	14.6
11	3.7	4.1	12.1	5.0	13.5
12	5.0	4.4	12.7	5.2	14.5
13	5.9	4.5	11.9	6.0	13.8
14	5.2	4.8	12.0	6.0	14.2
15	6.8	4.7	12.2	5.6	14.1
16	5.8	4.7	12.3	5.5	14.4
17	5.3	4.9	12.1	5.6	14.8
18	5.5	5.4	11.6	4.9	13.8
19	7.0	5.3	11.9	5.1	13.5
20	7.1	6.9	12.9	5.9	14.9
21	5.8	4.6	12.6	6.0	13.5
22	4.0	4.2	11.2	5.4	13.3
23	3.5	3.9	11.1	5.1	13.0
24	4.3	4.2	11.4	4.7	13.1
25	5.4	5.0	11.8	5.0	14.9
26	6.1	4.0	11.3	5.1	13.8
27	5.6	5.4	11.3	5.5	14.3
28	5.6	4.8	11.1	5.9	14.9
29	4.6	4.2	11.8	5.2	13.7
30	4.0	3.4	11.4	5.0	13.6
31	5.4	3.6	11.3	4.8	13.2
MEAN	5.0	4.4	11.7	5.0	13.8

TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

MAY 1978



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH



Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow -Norfolk circuit are represented above. Heavy solid lines represent field strengths -12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line. Adapted from Observations by Deutsche Bundespost

USCOMM-NOAA-ASHEVILLE, NC-8/78/950

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No407, pt2

JULY 1978 Number 407 - Part II

P-A STACKS

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DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

Solar-Geophysical Data comprehensive reports

Data for January 1978 -- December 1977 & Miscellanea
Explanation of Data Reports Issued as Number 402 (Supplement) February 1978

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA AND INFORMATION SERVICE / BOULDER, COLORADO

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Solar - Geophysical Data

NO. 407 JULY 1978

Part II (Comprehensive Reports)

DATA FOR
JANUARY 1978
DECEMBER 1977
& MISCELLANEA

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
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No. 407

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Chief
Solar-Terrestrial Physics Division

CONTENTS

PAGE

Part I (Prompt Reports)

Index for 1977 and 1978 2

Data for June 1978 3-41

Data for May 1978 43-169

Part II (Comprehensive Reports)

Index for 1977 and 1978 2

Data for January 1978 3-37

Data for December 1977 39-49

Miscellaneous Data 51-71

Solar Radio Waves
Spectral Observations; Harvard, Manila and Sagamore Hill; May 1978
Spectral Observations, Culgoora, April 1978
Selected Events by Radioheliograph, April 1978

Cosmic Rays
Neutron Monitor Daily Values, Alert and Deep River, March - April 1978
Chart of Variations, Alert and Deep River, April 1978

INDEX FOR 1977 AND 1978 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

		1977 Aug	Sep	Oct	Nov	Dec	1978 Jan	Feb	Mar	Apr	May	Jun
A.	SOLAR AND INTERPLANETARY PHENOMENA											
A.1	Sunspot Drawings	398A 36	399A 34	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.2a	Zurich Provisional Relative Sunspot Numbers Rz	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.2b	Zurich Final Sunspot Numbers Rz	404A 7	404A 8	404A 8	404A 8	404A 8						
A.2c	American Relative Sunspot Numbers RA'	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.3a	Mt. Wilson Magnetograms	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	404A 40	405A 48	406A 54	407A 46	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	398A 98	399A 94	400A 92	401A 96	402A100	403A108	404A 96	405A110	406A114	407A108	
A.3c	Kitt Peak Magnetograms	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	404A 40	405A 48	406A 54	407A 46	
A.3d	Mean Solar Magnetic Field (Stanford)	397A 25	398A 29	399A 29	400A 24	401A 31	402A 33	404A 33	404A 33	405A 36	406A 40	407A 40
A.4	H-alpha Filtergrams	398A 36	399A 34	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.5	Calcium Plage Drawings - McMath (or Catania)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.5a	Calcium Plage (McMath) and Sunspot Regions	398A 98	399A 94	400A 92	401A 96	402A100	403A108	404A 96	405A110	406A114	407A108	
A.5b	McMath Daily Calcium Plage Indices	398A105	399A 99	400A 99	401A100	402A105	403A114	404A104	405A119	406A124	407A118	
A.6	H-alpha Synoptic Charts	398A 34	399A 32	400A 28	401A 35	402A 36	403A 44	404A 38	405A 46	406A 52	407A 44	
A.6b	Synoptic Chart and Active Regions (Paris)	402B 4	403B 4	404B 4	405B 4	406B 4	407B 4					
A.7f	Helium D3 Chromosphere (Big Bear)	397A 19	398A 24	399A 24	400A 21	401A 28	402A 29	403A 36	404A 29	405A 31	406A 35	407A 34
A.7g	Helium Synoptic Maps (KPNO)	397A 20	398A 22	399A 23	400A 20	401A 27	402A 28	403A 35	404A 27	405A 32	406A 36	407A 36
A.7h	Coronal Line Emission (Sac Peak)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	404A 40	405A 48	406A 54	407A 46	
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.8g	Daily Values of Adjusted Solar Flux (AFGL)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9	404A 9	405A 9	406A 9	407A 9
A.9cb	8.6 mm Radio Maps of the Sun (NOSC - La Posta)	398A 36	400B 57	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.9d	2 cm Radio Maps of the Sun (NOSC - La Posta)	398A 36	400B 52	400A 30	401A 36	402A 38	403A 47	404A 40	405A 48	406A 54	407A 46	
A.10a	169 MHz - Interferometric Observations (Nancay)	397A 13	398A 14	399A 14	400A 12	401A 15	402A 16	403A 20	404A 17	405A 17	406A 19	407A 20
A.10c	21 cm East-West Solar Scans (Fleurs)	397A 15	398A 16	399A 16	400A 14	401A 17	402A 19	403A 23	404A 20	405A 20	406A 22	407A 23
A.10d	43 cm East-West Solar Scans (Fleurs)	397A 16	398A 17	399A 17	400A 15	401A 18	402A 20	403A 24	404A 21	405A 21	406A 23	407A 24
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	397A 14	398A 15	399A 15	400A 13	401A 16	402A 18	403A 22	404A 19	405A 19	406A 21	407A 22
A.10f	3 cm East-West Solar Scans (Toyokawa)					403B 68	402A 17	403A 21	404A 18	405A 18	406A 20	407A 21
A.11k	Solar X-ray Radiation (SOLRAD 11)						403A116	404A108	405A122	406A129	407A123	
A.11g	Solar X-ray (SMS/GOES)	----	398A 25	399A 20	400A 17	401A 22	402A 24	403A 29	404A 24	405A 29	406A 30	407A 29
A.11h	Solar X-ray (OSO-8; 1975-057A)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	404A 40	405A 48	406A 54	407A 46	
A.11i	Solar X-ray (Columbia U.)	404B 65	404B 69	404B 40								
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	397A 23	----	399A 26	----	----	402A 30	----	----	----	----	----
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	----	----	399A 27	----	----	402A 31	----	----	----	----	----
A.12e	Energetic Solar Particles (IMP H & J)	402B 24	403B 37	404B 35	405B 22	406B 43	407B 33					
A.12f	Energetic Solar Particles (GMS/SEM)	----	406B 78	----	----	----	----	----	----	----	406A 44	----
A.13a	Solar Wind (Pioneers 6 & 7)	397A 23	----	399A 26	----	----	402A 30	----	----	----	----	----
A.13ab	Solar Wind (Pioneers 8 & 9)	----	----	399A 27	----	----	402A 31	----	----	----	----	----
A.13d	Solar Wind from IPS Measurements	397A 27	398A 27	399A 25	400A 25	401A 29	402A 34	403A 37	404A 31	405A 37	406A 41	407A 35
A.13e	Solar Plasma (IMP H & J)	402B 23	403B 22	404B 34								
A.17	Interplanetary Magnetic Field (Pioneer 8)	----	----	----	----	----	----	----	----	----	----	----
A.17	Interplanetary Magnetic Field (Pioneer 9)	----	----	----	----	----	402A 31	----	----	----	----	----
A.17c	Inferred IP Magnetic Field	397A 24	398A 28	400A 22	400A 22	401A 30	402A 32	403A 38	404A 32	406A 38	406A 38	407A 38
A.18	Interplanetary Electric Field (Pioneer 8)	----	----	399A 27	----	----	----	----	----	----	----	----
A.18	Interplanetary Electric Field (Pioneer 9)	----	----	----	----	----	402A 31	----	----	----	----	----
B.	IONOSPHERIC (AND RADIO WAVE PROPAGATION) PHENOMENA											
B.52	Graphs of Transmission Frequency Range	398A124	399A128	400A120	401A116	402A132	403A148	404A144	405A158	406A171	407A168	
B.53	Quality Figures Based on Frequency Ranges	398A126	399A127	400A122	401A118	402A131	403A150	404A146	405A157	406A170	407A167	
C.	FLARE-ASSOCIATED EVENTS											
C.1a	Optical Observations Flares	397A 10	398A 10	399A 10	400A 10	401A 10	402A 12	403A 12	404A 12	405A 12	406A 12	407A 12
C.1ba	Optical Observations Flares (Standardized Data)	402B 8	403B 8	404B 8	405B 8	406B 8	407B 8					
C.1d	Flare Patrol Observations	397A 12	398A 13	399A 13	400A 11	401A 14	402A 15	403A 19	404A 16	405A 16	406A 18	407A 19
C.1d	Flare Patrol Observations	402B 17	403B 21	404B 22	405B 16	406B 25	407A 22					
C.1e	Flare Indices (by day)	402B 16	403B 20	404B 21	405B 15	406B 24	407A 21					
C.1f	Flare Indices (by Region)	403B 53	404B 53	405B 38	406B 59	407B 49						
C.3	Solar Radio Waves - Outstanding Occurrences	402B 18	403B 22	404B 23	405B 17	406B 26	407B 23					
	Solar Radio Waves - Fixed Frequencies - Selected	397A 17	398A 18	399A 18	400A 16	401A 19	402A 21	403A 25	404A 22	405A 22	406A 24	407A 25
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	399B 36	399A113	401B 44	403B 64	403B 65	405B 45	405B 48	406B 62	407B 67	407A151	
C.4a	Solar Radio Spectral Obs. (Fort Davis)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	406A144	407B 52	
C.4d	Solar Radio Spectral Obs. (Culgoora)	400B 62	399A102	401B 38	403B 56	403B 59	404B 56	405B 40	406B 64	407B 59	407A139	
C.4e	Solar Radio Spectral Obs. (Weissenau)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	406A144	407A139	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	406A144	407B 52	
C.4h	Solar Radio Spectral Obs. (Owingeloo)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	----	----	
C.4i	Solar Radio Spectral Obs. (Durnten)	398A107	399A102	400A101	401A102	402A108	403A132	404A122	405A138	406A144	407A139	
C.4j	Solar Radio Spectral Obs. (Manila)		399A102	400A101	401A102	402A108	406B 70	404A122	405A138	406A144	407B 52	
C.5e	Solar X-ray (SMS/GOES)	397A 22	399B 37	399A 22	400A 19	401A 24	402A 26	403A 29	404A 26	----	406A 32	407A 29
C.5f	Solar X-ray (Columbia U.)											
C.6	Sudden Ionospheric Disturbances	398A106	399A100	400A100	401A101	402A106	403A115	404A105	405A120	406A125	407A119	
D.	GEOMAGNETIC AND MAGNETOSPHERIC PHENOMENA											
D.1a	Geomagnetic Indices Kp, Kn, Ks, Km, Ap, aa, Cp	398A117	399A120	400A113	401A109	402A125	403A142	404A139	405A151	406A162	407A160	
D.1ba	27-day Chart of Kp Indices	398A119	399A122	400A115	401A111	402A127	403A144	404A141	405A153	406A164	407A162	
D.1c	27-day Chart of C9	404A142	404A142	404A142	404A142	404A142						
D.1d	Principal Magnetic Storms	398A122	399A125	400A118	401A114	402A130	403A145	404A143	405A156	406A167	407A165	
D.1e	Reduced Magnetograms								405A 39			
D.1f	Sudden Commencement and Solar Flare Effects	398A123	399A126	400A119	401A115	403B 69	403A147	405B 55	406B 72	406A169	407A166	
D.1g	Equatorial Indices Dst	398A121	399A124	400A117	401A113	402A129	405B 53	405B 54	405A155	406A166	407A164	
F.	COSMIC RAYS											
F.1a	Cosmic Ray Neutron Counts (Deep River)	398A116	399A115	400A112	402B 47	402A124	403A138	404A138	405A150	407B 70	407A155	
F.1b	Cosmic Ray Neutron Counts (Climax)	398A116	399A115	400A112	401A108	406B 73	406B 73	406B 73	406B 73	406A161		
F.1e	Cosmic Ray Neutron Counts (Alert)	398A116	399A115	400A112	402B 47	402A124	403A138	404A138	405A150	407B 70	407A155	
F.1f	Cosmic Ray Neutron Counts (Calgary)	400B 70	400B 70	402B 47								
F.1g	Cosmic Ray Neutron Counts (Sulohur Mountain)	400B 70	----	402B 47								
F.1h	Cosmic Ray Neutron Counts (Thule)											
F.1i	Cosmic Ray Neutron Counts (Kiel)	398A116	399A115	400A112	401A108	402A124	403A138	404A138	405A150	406A161	407A155	
F.1j	Cosmic Ray Neutron Counts (Tokyo)	398A116	399A115	400A112	401A108	402A124	403A138	404A138	405A150	406A161	407A155	
F.1k	Cosmic Ray Neutron Counts (Kula)	398A116										
H.	MISCELLANEOUS											
H.60	IUWDS Alert Decisions	397A 4	398A 4	399A 4	400A 4	401A 4	402A 5	403A 5	404A 4	405A 4	406A 4	407A 4
H.62	Abbreviated Calendar Record	403B 46	404B 46	405B 30	406B 52	407B 42						

Notes:

"398A 36" listed under 1977 Aug means that data for August 1977 were contained in *Solar-Geophysical Data* Number 398 - Part I, beginning on page 36.

A = Part I, B = Part II.

---- = no data available.
blank = data not yet received.

JANUARY 1978 DATA

Contents

	Page
Active Regions	4-5
Synoptic Solar Maps	6-7
Solar Flares	
Hα Solar Flares (Standardized Data)	8-20
Daily Flare Indices	21
No-Flare-Patrol Chart	22
Solar Radio Waves	
Worldwide Outstanding Occurrences at Fixed Frequencies	23-32
Energetic Solar Particles and Plasma (IMP 7 and 8 Solar Wind Plasma data not available at time of publication)	33-37
Solar X-ray Radiation (Data not available at time of publication)	

ACTIVE REGIONS

CARRINGTON ROTATION 1663

(December 21, 1977 to January 17, 1978)

Region No.	Coordinates		Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1662	Activity at West Limb
	Lat.	Long.					
1	29°S	356°	+2	3			decreasing
2	23 N	321	>6	3			decreasing
3	23 N	252	0	1	x		decreasing
4	22 N	235	>6	5			increasing
5	24 N	220	+4	1	x		disappeared
6	20 S	204	>6	3		(12)	decreasing
7	23 S	185	>6	1	x	(13)	dispersed
8	16 N	182	0	2			stable
9	16 S	180	-2	2			decreasing
10	20 S	175	>6	3			decreasing
11	32 S	175	-5	1	x		(?)
12	37 N	164	>6	2			decreasing
13	17 N	157	>6	1	x		dispersed
14	30 N	155	>6	1	x		disappeared
15	34 N	155	-3	1	x		decreasing
16	27 N	145	>6	1	x		dispersed
17	19 N	144	>6	1	x		decreasing
18	27 S	141	>6	1	x	(18)	decreasing
19	24 N	140	>6	1	x		decreasing
20	24 S	117	+3	1	x		decreasing
21	28 S	117	>6	1	x	(19)	decreasing
22	16 N	115	>6	1	x		decreasing
23	26 S	77	-2	1	x		decreasing
24	20 N	67	>6	3			stable
25	21 S	66	-1	1	x		decreasing
26	21 N	57	>6	1	x	(26)	dispersed
27	7 N	45	>6	1	x	(28)	decreasing

ACTIVE REGIONS

CARRINGTON ROTATION 1664

(January 17 to February 14, 1978)

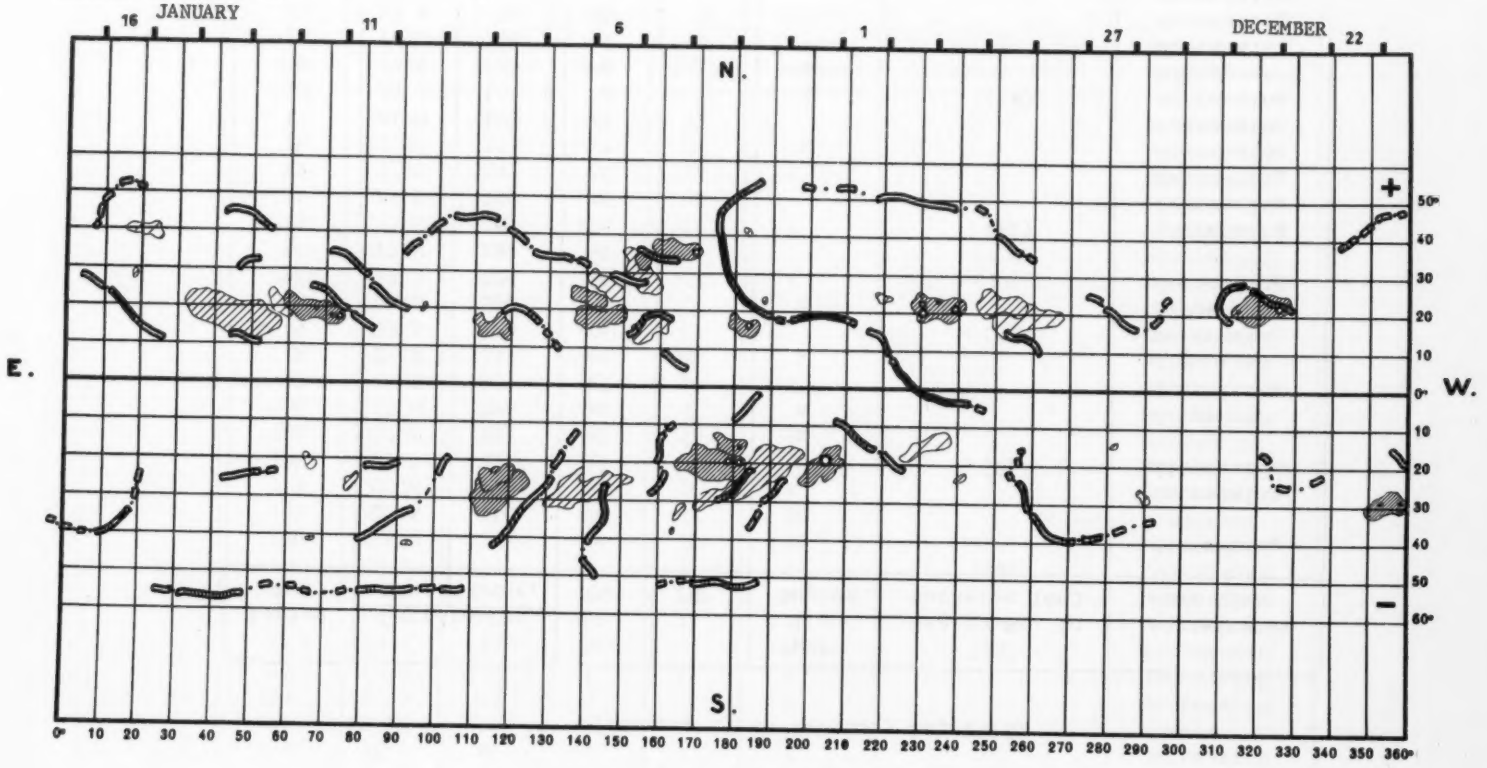
Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1663	Activity at West Limb
1	15°N	356°	>6	1	x		decreasing
2	25 S	356	>6	2	x		
3	23 S	354	-2	4			increasing
4	27 N	317	>6	1	x	(2)	dispersed
5	27 N	297	+1	1	x		
6	19 N	256	>6	1	x		dispersed
7	18 N	254	+3	4			decreasing
8	27 N	247	>6	1	x		dispersed
9	22 N	234	>6	2		(4)	decreasing
10	40 N	220	+1	1	x		dispersed
11	17 S	209	>6	2			decreasing
12	17 S	168	+4	2			
13	33 S	161	>6	3		(11)	decreasing
14	16 N	160	>6	2			decreasing
15	27 S	159	>6	3			decreasing
16	33 N	153	-1	1	x		decreasing
17	21 N	145	>6	3			decreasing
18	28 S	143	>6	1	x	(18)	decreasing
19	12 N	139	>6	1	x		disappeared
20	26 N	108	+4	2			decreasing
21	28 S	83	>6	3			decreasing
22	19 N	80	>6	3			decreasing
23	25 N	73	>6	4			decreasing
24	17 N	69	>6	4		(24)	decreasing
25	25 N	61	>6	1	x		dispersed
26	28 S	31	0	2			decreasing
27	15 N	30	>6	7			stable

SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1663

DECEMBER 21 TO JANUARY 17, 1978

MEUDON OBSERVATORY

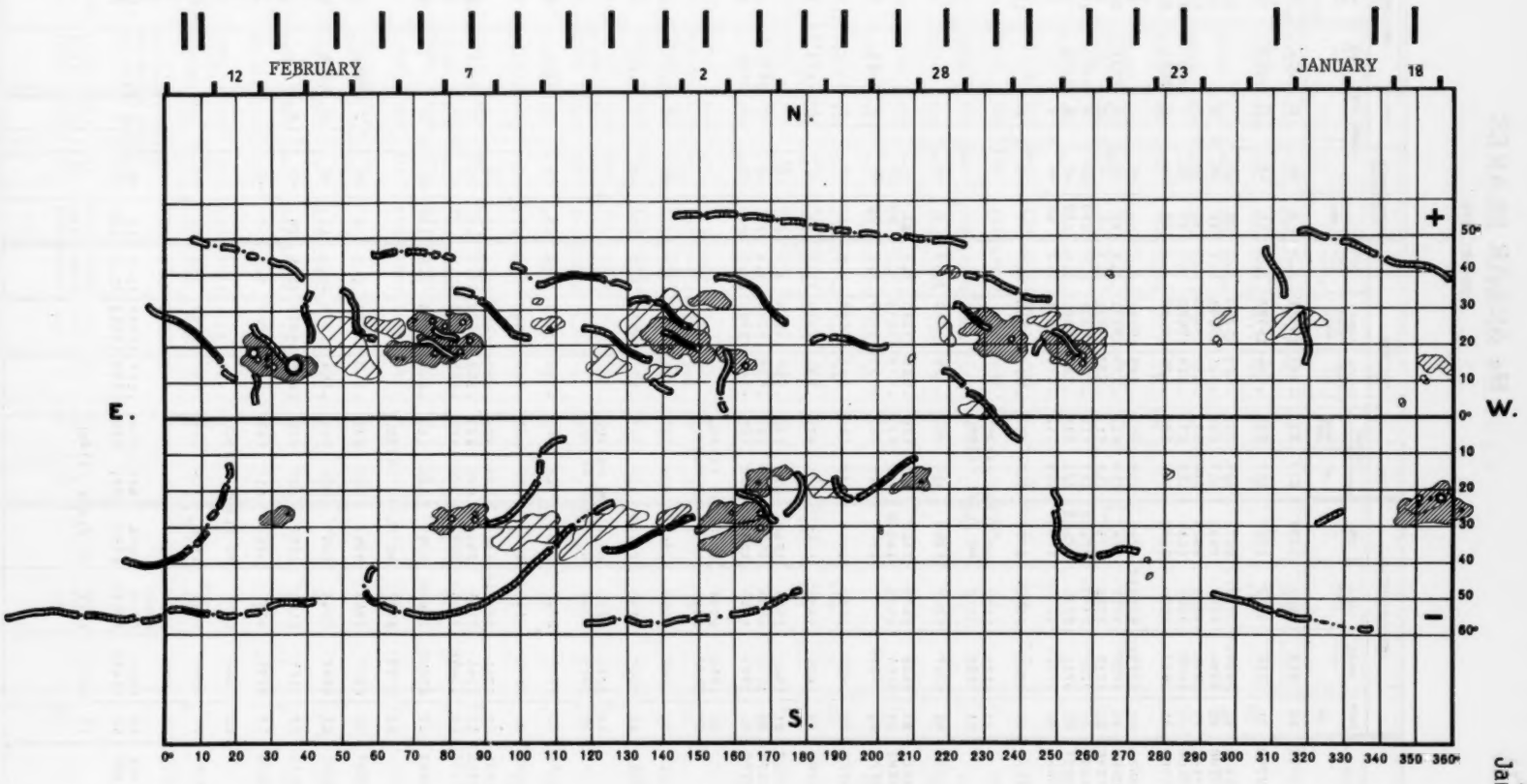


SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1664

JANUARY 17 TO FEBRUARY 14, 1978

MEUDON OBSERVATORY



7 Jan 78

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
					APPROX		CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY									
	DATE JAN	START	MAX. PHASE	END	LAT.	MER. DIST.				MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
418 CULG	01	0018	0020	0027	S19	E16	.381	15081	2.2	9	-N		C	0020	25	.3		Y5
419 VORO	01	0216	0217	0227	S18	E38	.644	15083	3.9	11	-B		C	0217	134	1.7	E	Y5
GRP65420	01	0554+3	0557+7	0626	S18	E36	.620	15083	3.9	32	1N				200	2.5	F	
TEHR	01	0554	0557	0606	S17	E38	.641	15083	4.1	12	-N	2	C		190		FDE	
MANI	01	0554	0600	0626	S18	E37	.632	15083	4.0	32	1N	3	P		200	2.7	F	
TACH	01	0555	0602	0634	S20	E34	.605	15083	3.8	39	2N		C	0602	574	7.3	F	
CULG	01	0557	0604	0626	S19	E36	.625	15083	3.9	29	1N		C	0604	200	2.6		
GRP65421	01	0725+2	0730+3	0741	S19	E12	.339	15081	2.2	16	-F				90	1.0	FHK	
CULG	01	0725	0731	0747	S19	E12	.339	15081	2.2	22	-N		C	0731	100	1.1		
TEHR	01	0727	0730	0737	S18	E13	.337	15081	2.3	10	-F	2	C		63			
ABST	01	0727	0733	0744D	S17	E10	.294	15081	2.1	17D	1N		P	0733	192	2.1	FK	
ABST	01	0731	0734	0744D	S21	E15	.393	15081	2.4	13D	-F		P	0734	70	.8	D	
MANI	01	0732E	0732U	0738	S19	E12	.339	15081	2.2	6D	-F	3	V		80	.8	H	
422 TEHR	01	0920	0922	0932	S17	E37	.628	15083	4.2	12	-N	1	C		127		FDE	Y5
	01	1126	1137	NO FLARE PATROL														
	01	1202	1228	NO FLARE PATROL														
423 KANZ	01	1347	1347	1350	N22	W23	.554	15080	30.8	3	-F						D	Y5
GRP65424	01	1405	1409	1418	S21	E26	.516	15083	3.5	13	-F						G	
KANZ	01	1405	1409	1413D	S20	E23	.472	15083	3.3	8D	-F						G	
HTPR	01	1410E		1418	S22	E29	.559	15083	3.8	8D	-F		C	1414	50	.6		
425 HTPR	01	1430	1432	1444	S19	E34	.600	15083	4.2	14	-F		C	1432	20	.2		Y5
426 HTPR	01	1435	1438	1448	N21	W22	.534	15080	31.0	13	-F		C	1438	10	.1		Y5
GRP65427	01	1502	1506	1546	S20	E30	.557	15083	3.9	44	-N						E	
HTPR	01	1502	1506	1526	S19	E33	.588	15083	4.1	24	-N		C	1505	80	.9	E	
HTPR	01	1503	1506	1546	S22	E28	.547	15083	3.7	43	-N		C	1506	60	.7		
	01	1550	1930	NO FLARE PATROL														
	01	2030	2041	NO FLARE PATROL														
428 CULG	01	2145	2153	2216D	S21	E06	.324	15081	2.4	31D	2N		C	2153	540	5.7	UV	Y5
429 CULG	01	2147	2155	2216D	S19	E28	.526	15083	4.0	29D	-N		C	2155	80	.9	F	Y5
	01	2215	2236	NO FLARE PATROL														
	01	2315	2342	NO FLARE PATROL														
430 VORO	02	0007	0012	0033	S17	E02	.242	15081	2.2	26	-B		C	0012	152	1.6	EJ	Y5
431 VORO	02	0158	0159	0205	N22	W30	.624	15080	30.8	7	-B		C	0159	72	.9	D	Y5
GRP65432	02	0344	0345+1	0357	N20	W29	.597	15080	31.0	13	-N						E	
VORO	02	0344	0346	0402	N21	W33	.647	15080	30.7	18	-B		C	0346	108	1.4	E	
MANI	02	0345E	0345U	0352	N20	W26	.566	15080	31.2	7D	-F	3	V		40	.5		
433 MANI	02	0345E	0345U	0355	S24	E19	.466	15083	3.6	10D	-F	3	V		30	.3		Y5
	02	0729	0732	NO FLARE PATROL														
434 MONT	02	0947	0948	0953	S17	W01	.240	15081	2.3	6	-F		C	0948	50			Y5
435 MONT	02	1047	1048	1059	N20	W44	.754	15075	30.1	12	-F		C	1048	50		E	Y5
436 KHAR	02	1125	1135	1150	N22	W36	.685	15080	30.8	25	-F		P				D	Y5
437 KANZ	02	1205	1205	1212	N17	E43	.731	15087	5.7	7	-F						DG	Y5
	02	1444	2116	NO FLARE PATROL														
438 RAMY	02	1646	1649	1658	S14	E17	.342	15083	4.0	12	-N	3	C		32		H	Y5
GRP65439	02	1925	1928 1942	1947	N20	W38	.693	15080	31.0	22	-N							
PALE	02	1925	1928	1944	N19	W38	.687	15080	31.0	19	-N	3	C		115		FDE	
RAMY	02	1940E	1942U	1950	N21	W39	.709	15080	30.9	10D	-N	3	C		95		F	
	02	2152	2257	NO FLARE PATROL														

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX HER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
GRP65440	02	2229+2	2242+2	2316	S18	E13	.335	15083	3.9	47	-N				140	1.5	
CULG	02	2229	2242	2312	S17	E13	.323	15083	3.9	43	-N		C	2242	140	1.5	
PALE	02	2231	2244	2319	S19	E14	.358	15083	4.0	48	-N	3	C		136		DE F
441 PALE	02	2358	2359	0000	N19	W43	.740	15080	30.8	2	-F	3	C		62		DE Y5
442 HANI	03	0204	0209	0215	S21	W06	.321	15081	2.6	11	-N	3	P		60	.6	F Y5
GRP65443	03	0226+4	0234+1 0242	0259	N20	W44	.755	15080	30.8	33	-N						
CULG	03	0226E	0242	0331D	N20	W44	.755	15080	30.8	65D	1N		C	0242	130	2.0	
KODA	03	0230E	0234	0249	N20	W45	.765	15080	30.7	19D	-N		V	0230			D
HANI	03	0230	0235	0259	N19	W44	.751	15080	30.8	29	-N	3	P		80	1.2	F
444 CULG	03	0307	0308	0316D	N36	E25	.715	15090	5.0	9D	-F		C	0308	30	.4	Y5
445 CULG	03	0308	0315	0331D	N16	W48	.779	15080	30.5	23D	1F		C	0315	160	2.2	Y5
446 HONT	03	0930E	0935	0943	S15	E07	.236	15083	3.9	13D	-F		C	0935	60		E Y5
447 HONT	03	0930E	0937	0941	N23	W47	.796	15080	30.9	11D	-F		C	0937	50		D Y5
448 KANZ	03	1001	1001	1004	S17	W16	.356	15081	2.2	3	-F						Y5
449 KANZ	03	1001	1004	1008	N35	E32	.750	15088	5.8	7	-F						E Y5
450 KANZ	03	1004	1015	1019	N23	W48	.805	15080	30.8	15	-F						Y5
GRP65451	03	1015+0	1019+1	1059	S15	E07	.236	15083	4.0	44	1B				450	4.6	EU
LOCA	03	1015E	1020	1105	S15	E06	.228	15083	3.9	50D	2N		P	1020	509	5.4	
HTPR	03	1015		1039D	S18	E09	.296	15083	4.1	24D	1B		C	1020	400	4.0	EU
KANZ	03	1015	1019	1053	S15	E06	.228	15083	3.9	38	1B						U
WEND	03	1026E		1050D	S14	E07	.221	15083	4.0	24D	1N		P		400	4.0	
452 KANZ	03	1131	1133	1137	N18	W52	.824	15080	30.6	6	-F						Y5
GRP65453	03	1156+6	1200+2	1210	S19	W19	.412	15081	2.1	14	-N						
RAMY	03	1156E	1200	1209D	S19	W19	.412	15081	2.1	13D	-N	4	C		45		DE
KANZ	03	1202	1202	1210	S20	W19	.422	15081	2.1	8	-N						
454 KANZ	03	1341	1345	1348	N21	W51	.824	15080	30.7	7	-F						Y5
GRP65455	03	1351+2	1351+4	1357	S20	E04	.296	15083	3.9	6	-F						E
KANZ	03	1351	1351	1355	S19	E04	.280	15083	3.9	4	-N						E
HTPR	03	1353	1355	1358	S21	E05	.316	15083	4.0	5	-F		C	1355	30	.3	E
456 HCMA	03	1526	1527	1529D	N23	W52	.839	15080	30.7	3D	-N		P	1527	40	.7	E Y5
457 HCMA	03	1533E	1535	1541D	S20	W22	.458	15081	2.0	8D	-F		P	1535	25	.3	D Y5
GRP65458	03	1617	1620 1626	1630	S20	W22	.458	15081	2.0	13	-N						EK
HCMA	03	1617	1620	1630	S20	W22	.458	15081	2.0	13	-N		C	1620	40	.5	EK
HCMA	03	1617	1626	1630	S20	W22	.458	15081	2.0	13	-N		C				
459 HCMA	03	1700	1701	1709	S20	W22	.458	15081	2.1	9	-F		C	1701	30	.4	E Y5
	03	1734	1744	NO FLARE PATROL													
	03	1801	1820	NO FLARE PATROL													
460 RAMY	03	1802E	1804	1818	S23	E37	.655	15086	6.5	16D	-N	4	C		95		F R Y5
461 HCMA	03	1826	1828	1850	S20	W19	.422	15081	2.3	24	-N		C	1828	25	.3	D Y5
	03	1852	1902	NO FLARE PATROL													
GRP65462	03	1852	1854	1906	S20	E07	.311	15083	4.3	14	1N						
RAMY	03	1852	1854	1906	S20	E07	.311	15083	4.3	14	1N	3	C		206		F
HCMA	03	1902E		1903D	S21	E07	.326	15083	4.3	1D	-N		P	1903	35	.4	D
	03	1903	1942	NO FLARE PATROL													
	03	1953	2058	NO FLARE PATROL													
	03	2131	2138	NO FLARE PATROL													
GRP65463	03	2144+0	2145+0	2157	S17	E02	.240	15083	4.1	13	-F				40	.4	
CULG	03	2144	2145	2203	S15	E02	.207	15083	4.1	19	-N		C	2145	40	.4	
PALE	03	2144	2145	2151	S19	E02	.274	15083	4.1	7	-F	3	C		37		DE

Hα SOLAR FLARES

JANUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	JAN																
464 CULG	03	2157	2158	2210	S22	W20	.454	15081	2.4	13	-F		C	2158	20	.2	Y5
	03	2302	2320	NO FLARE PATROL													
465 CULG	03	2343	2346	0006	S21	W21	.455	15081	2.4	23	-F		C	2346	20	.2	Y5
466 VORO	04	0026	0029	0034	N22	W54	.853	15080	31.0	8	-B		C	0029	63	1.2	D Y5
467 VORO	04	0054	0056	0106	N22	W54	.853	15080	31.0	12	-B		C	0056	36	.6	DJ Y5
468 VORO	04	0217	0220	0228	S20	W22	.456	15081	2.4	11	-B		C	0220	161	1.8	E Y5
GRP65469	04	0254+1	0257+1	0306D	N23	W58	.886	15080	30.8	12	1N						E
VORO	04	0254	0257	0304D	N23	W58	.886	15080	30.8	100	2N		C	0257	278	6.5	E
MITK	04	0255	0258	0306	N24	W59	.895	15080	30.7	11	1N		C	0258	180	3.9	
KODA	04	0257E	0340	0356	N21	W54	.850	15080	31.1	590	-N		V	0257			E
470 MITK	04	0446	0447	0453	N39	E17	.709	15090	5.5	7	-N		C	0447	70	1.0	E Y5
471 MITK	04	0624	0628	0639D	N20	W61	.901	15080	30.7	15D	-N		C	0628	70	1.7	D Y5
472 KANZ	04	0849E		0855	S14	W07	.220	15083	3.8	6D	-N						Y5
473 HTPR	04	0904E		0935D	N20	W80	.990	15075	29.4	31D	-F		C	0911	20	.5	Y5
474 HTPR	04	1236	1237	1244	N20	W83	.996	15075	29.3	8	-F		C	1237	10	.2	Y5
475 HTPR	04	1330	1331	1335	N19	W70	.953	15080	30.3	5	-F		C	1331	20	.5	Y5
	04	1503	2328	NO FLARE PATROL													
GRP65476	04	1812+8	1826+8	1846	N21	W66	.934	15080	30.8	34	-F				30		F
PALE	04	1812	1826	1846	N21	W66	.934	15080	30.8	34	-F	3	V		26		F
PALE	04	1812	1826	1846	N21	W66	.934	15080	30.8	34	-F	3	C		26		F
GRP65477	04	1925+0	1925+0	1936	N21	W66	.934	15080	30.9	11	-F				20		F
PALE	04	1925	1925	1936	N21	W66	.934	15080	30.9	11	-F	3	C		17		F
PALE	04	1925	1925	1936	N21	W66	.934	15080	30.9	11	-F	3	V		17		F
GRP65478	04	2010+0	2011+0	2019	N21	W67	.939	15080	30.8	9	-F				20		F
PALE	04	2010	2011	2019	N21	W67	.939	15080	30.8	9	-F	3	C		17		F
PALE	04	2010	2011	2019	N21	W67	.939	15080	30.8	9	-F	3	V		17		F
GRP65479	04	2115+0	2117+0	2124	N21	W67	.939	15080	30.9	9	-F				30		F
PALE	04	2115	2117	2124	N21	W67	.939	15080	30.9	9	-F	3	C		33		F
PALE	04	2115	2117	2124	N21	W67	.939	15080	30.9	9	-F	3	V		33		F
480 PALE	04	2308	2313	2335	S19	W13	.345	15083	4.0	27	-N	3	C		73		DE Y5
481 PALE	04	2319	2322	2330	S19	W36	.622	15081	2.3	11	-F	3	C		40		DE Y5
482 PALE	05	0018	0038	0056	N21	W69	.950	15080	30.8	38	-F	3	C		30		DE Y5
483 PALE	05	0116	0116	0124	N21	W69	.950	15080	30.9	8	-F	3	C		21		DE Y5
	05	0225	0240	NO FLARE PATROL													
484 MANI	05	0353E	0353U	0357	N19	W71	.958	15080	30.8	4D	-F	3	P		20	.4	Y5
485 MANI	05	0514E	0514U	0531D	N19	W74	.971	15080	30.7	17D	-F	3	P		20	.5	Y5
	05	0705	0728	NO FLARE PATROL													
486 ABST	05	0806E	0809	0809D	N21	W80	.990	15080	30.3	3D	-F		P	0809	61		DZ Y5
GRP65487	05	1034+0	1044+0	1108	S15	W20	.388	15083	3.9	34	-F						E
MONT	05	1034	1044	1106	S14	W20	.381	15083	3.9	32	-F		C	1044	60		E
HTPR	05	1034	1044	1110	S16	W20	.396	15083	3.9	36	-F		C	1044	20	.2	
488 HTPR	05	1419	1431	1435	S25	E43	.726	15093	8.8	16	-F		C	1431	20	.3	Y5
489 HTPR	05	1438	1442	1448	S25	E43	.726	15093	8.8	10	-F		C	1442	10	.1	Y5
490 HTPR	05	1448	1456	1503	S17	W46	.732	15081	2.2	15	-F		C	1456	20	.3	Y5
491 HTPR	05	1506	1516	1525	S25	E42	.716	15093	8.8	19	-F		C	1516	20	.3	Y5

Hα SOLAR FLARES

JANUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg	
	05	1526	2018	NO FLARE PATROL													
492 PALE	05	1858	1859	1903	N21	W79	.988	15080	30.9	5	-F	3	C		21		DE F Y5
493 PALE	05	2028	2030	2037	N21	E13	.463	15089	6.8	9	-F	3	C		28		DE Y5
GRP65494	05	2031>9	2040 2102	2108	S18	W49	.767	15081	2.2	37	-F						
PALE	05	2031	2040	2102	S19	W48	.759	15081	2.3	31	-F	3	C		35		DE
CULG	05	2051	2102	2113D	S18	W50	.777	15081	2.1	22D	-F		C	2102	40	.6	
	05	2113	2120	NO FLARE PATROL													
	05	2228	2300	NO FLARE PATROL													
495 VORO	06	0154	0156	0202	S30	E37	.692	15093	8.9	8	-B		C	0156	54	.7	EGH Y5
496 CULG	06	0302	0307	0335	N35	W05	.627	15090	5.8	33	-F		C	0307	30	.4	F Y5
497 CULG	06	0724	0731	0759D	N35	W04	.626	15088	6.0	35D	-F		C	0731	80	1.0	Y5
GRP65498	06	0810>9	0828+4	0836	S18	W55	.826	15081	2.2	26	-F				45	.8	D
BUCA	06	0810		0845	S16	W56	.833	15081	2.1	35	-F		C	0833	53	1.0	D
KANZ	06	0817	0828	0832	S18	W54	.817	15081	2.3	15	-F						
HTPR	06	0826	0832	0836	S19	W56	.836	15081	2.2	10	-F		C	0832	40	.7	
GRP65499	06	0903+1	0903+3	0911	S18	W56	.835	15081	2.2	8	-F						DJ
HTPR	06	0851	0857	0913	S15	W60	.867	15081	1.9	22	-F		C	0857	20	.4	
HTPR	06	0901	0903	0906	S19	W56	.836	15081	2.2	5	-F		C	0903	40	.7	
KANZ	06	0903		0903D	S18	W54	.817	15081	2.3		-F						
ABST	06	0904	0906	0909	S19	W56	.836	15081	2.2	5	-F		C	0906	105	1.9	DJ
GRP65500	06	1014+1	1015+1	1019	S19	W55	.827	15081	2.3	5	-F				45	.8	D
HTPR	06	1014	1015	1019	S19	W56	.836	15081	2.2	5	-F		C	1015	50	.7	
MONT	06	1015	1016	1018	S20	W55	.829	15081	2.3	3	-F		C	1016	40		D
501 HTPR	06	1022	1025	1031	N17	E33	.623	15092	8.9	9	-F		C	1025	10	.1	Y5
GRP65502	06	1056>9	1101 1110+2	1115	S18	W54	.817	15081	2.4	19	-F				30	.5	
MONT	06	1056	1101	1111	S15	W53	.803	15081	2.5	15	-F		C	1101	50		
HTPR	06	1107	1110	1116	S19	W57	.845	15081	2.2	9	-F		C	1110	20	.3	
MONT	06	1110	1112	1114	S20	W50	.781	15081	2.7	4	-F		C	1112	40		D
503 HTPR	06	1103	1106	1119	N16	W17	.435	15087	5.2	16	-F		C	1106	30	.3	Y5
504 HTPR	06	1321	1323	1326	N17	E32	.612	15092	9.0	5	-F		C	1323	10	.1	Y5
	06	1527	1747	NO FLARE PATROL													
505 RAMY	06	1635E	1638U	1715D	S17	W60	.869	15081	2.2	40D	-N	3	C		95		F Y5
506 PALE	06	1804	1852	1912D	S19	W61	.878	15081	2.2	68D	-F	3	C		53		DE Y5
	06	1815	1828	NO FLARE PATROL													
	06	1912	2019	NO FLARE PATROL													
GRP65507	07	0036+6	0043+1	0051	S20	W64	.901	15081	2.2	15	-N				80	1.9	
CULG	07	0036	0044	0055	S20	W65	.908	15081	2.2	19	-N		C	0044	60	1.4	
MITK	07	0042	0043	0046	S21	W64	.902	15081	2.2	4	-N		C	0043	110		
GRP65508	07	0123+5	0136+3 0146	0217	S21	W63	.895	15081	2.3	54	1F				200	4.7	EJUY
PALE	07	0046E	0136U	0222D	S19	W64	.901	15081	2.2	96D	1N	3	C		250		U F
CULG	07	0123	0139	0238	S23	W64	.904	15081	2.3	75	1N		C	0130	170		UY
MITK	07	0127	0146	0155	S22	W62	.889	15081	2.4	28	1F		C	0146	120	2.6	E
VORO	07	0128	0136	0212	S20	W64	.901	15081	2.3	44	2F		C	0136	270	6.1	EJ
GRP65509	07	0305+3	0312+2	0329	S23	W65	.911	15081	2.3	24	-N				90		JK
MITK	07	0305	0314	0329	S21	W65	.909	15081	2.3	24	1N		C	0314	130	2.6	
CULG	07	0306	0312	0425	S25	W65	.912	15081	2.3	79	-N		C	0312	80		FK
VORO	07	0308	0312	0322	S22	W66	.916	15081	2.2	14	-B		C	0312	72	1.6	DJ
GRP65510	07	0632	0647	0651D	S16	W65	.906	15081	2.4	19	1F						E
MITK	07	0632	0647	0651D	S18	W66	.914	15081	2.3	19D	1F		C	0647	140		E
MANI	07	0637E	0637U	0639D	S15	W64	.898	15081	2.5	2D	1N	3	V		100	2.1	
	07	0651	0740	NO FLARE PATROL													

Hα SOLAR FLARES

JANUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONG	TYPE	TIME UT	MEAS. AREA mill. of Disk	CORR AREA Sq. Deg.	
GRP65511	07	0740E		0821	S18	W68	.927	15081	2.2	41	-F						D
BUCA	07	0740E		0810	S16	W73	.955	15081	1.8	30D	-F		P	0745	43		D
KANZ	07	0748E		0821	S18	W66	.914	15081	2.4	33D	-F						
HTPR	07	0757E		0825	S19	W68	.927	15081	2.2	28D	-F		C	0804	40	.8	
GRP65512	07	1113>9	1209+6 1228+5	1323	S20	W71	.945	15081	2.1	130	-N						EU
KANZ	07	1113	1233	1327	S19	W69	.933	15081	2.3	134	-N						
KANZ	07	1113	1248	1305	S19	W79	.980	15081	1.5	112	-B						
MONT	07	1114	1213	1325D	S22	W71	.946	15081	2.1	131D	1N		C	1213	220		F
HTPR	07	1145	1215	1320	S18	W70	.939	15081	2.2	95	-N		C	1215	60	1.3	E
HTPR	07	1150	1209	1222	S22	W69	.935	15081	2.3	32	-F		C	1209	40	.8	
RAMY	07	1225E	1228	1235D	S18	W71	.944	15081	2.2	10D	-N	2	C		96		DE
WEND	07	1228E		1308	S19	W70	.939	15081	2.3	40D	1F		V		300	9.9	E
KANZ	07	1254	1301	1309	S20	W71	.945	15081	2.2	15	-N						U
KANZ	07	1312	1316	1327	S19	W79	.980	15081	1.6	15	-N						
513 HTPR	07	1334	1338	1347	S24	W43	.721	15083	4.3	13	-F		C	1338	20	.3	Y5
514 HTPR	07	1452	1454	1458	S21	W73	.955	15081	2.1	6	-F		C	1454	40	.9	Y5
	07	1622	2048	NO FLARE PATROL													
515 CULG	07	2244	2247	2258	S28	W05	.419	15086	7.6	14	-N		C	2247	30	.3	Y5
516 CULG	08	0000	0001	0003	S16	W53	.803	15083	4.0	3	-N		C	0001	20	.3	Y5
517 CULG	08	0002	0006U	0100	S22	W80	.983	15081	2.0	58	1F		C	0006	80		F Y5
GRP65518	08	0205+5	0216+2 0237+9	0321	S20	W79	.979	15081	2.2	76	2N						HJK
CULG	08	0205	0218	0415	S21	W80	.983	15081	2.1	130	1N		C	0218	200		K
VORO	08	0206	0227	0317	S20	W78	.976	15081	2.2	71	3F		C	0227	376	18.7	EHJ
MANI	08	0210	0216	0318D	S12	W80	.983	15081	2.1	68D	1N	3	P		80	2.1	F
MANI	08	0210	0237	0318D	S12	W80	.983	15081	2.1	68D	2N	3	P		200	5.3	F
PALE	08	0219E	0219U	0323D	S19	W78	.976	15081	2.2	64D	1B	3	C		200		FDE
PALE	08	0219E	0246U	0323D	S19	W78	.976	15081	2.2	64D	2B	3	C		250		FDE
519 CULG	08	0432	0448	0520	S22	W80	.983	15081	2.2	48	-F		C	0448	25		Y5
520 HANI	08	0710	0713	0749	S12	W85	.995	15081	1.9	39	2B	3	P		300	8.8	F Y5
GRP65521	08	0903+4	0909	0912	S16	W83	.991	15081	2.2	9	-N						D
HTPR	08	0903	0909	0912	S18	W88	.999	15081	1.8	9	-N		C	0909	20		
KANZ	08	0907		0907D	S14	W78	.976	15081	2.5		-F						D
522 HTPR	08	1150	1155	1220	S14	W60	.866	15083	4.0	30	-F		C	1155	10	.2	Y5
	08	1800	2037	NO FLARE PATROL													
	08	2111	2118	NO FLARE PATROL													
	08	2157	2306	NO FLARE PATROL													
	09	0637	0653	NO FLARE PATROL													
GRP65523	09	0750+5	0806+1	0820	S23	W90	1.000	15081	2.6	30	-F						
KANZ	09	0750	0807	0819	S22	W90	1.000	15081	2.6	29	-F						
CULG	09	0755	0806	0821D	S25	W90	1.000	15081	2.6	26D	1F		C	0806	60		
GRP65524	09	1106+1	1111 1123	1136	S18	W90	1.000	15081	2.7	30	-F						
KANZ	09	1106	1123	1136	S18	W90	1.000	15081	2.7	30	-F						
MONT	09	1107	1111	1124D	S19	W90	1.000	15081	2.7	17D	-F		C	1111	60		
GRP65525	09	1119+1	1124	1133	S23	W09	.358	15093	8.8	14	-F						
HTPR	09	1119	1124	1130	S23	W11	.372	15093	8.6	11	-F		C	1124	10	.1	
KANZ	09	1120	1133	1136	S23	W08	.352	15093	8.9	16	-F						
526 KANZ	09	1218		1311	S19	W90	1.000	15081	2.8	53	-F						Y5
	09	1545	2008	NO FLARE PATROL													
	09	2113	2120	NO FLARE PATROL													
527 CULG	09	2224	2225	2258	S34	W70	.947	15096	4.7	34	-F		C	2225	20		Y5
GRP65528	09	2250+5	2257+1	2306	S18	W82	.988	15083	3.8	16	1B				150		
CULG	09	2250	2257	2302D	S18	W86	.996	15083	3.5	12D	2B		C	2257	180		
PALE	09	2255	2258	2306	S18	W79	.979	15083	4.0	11	1N	3	V		115		FDE

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		CONG.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	09	2258	2355	NO FLARE PATROL														
529 CULG	10	0135	0207	0257D	N15	W90	1.000	15095	3.3	82D	-N		C	0207	30			Y5
530 CULG	10	0402	0405	0407	N20	W42	.740	15089	7.0	5	-N		C	0405	20	.3		Y5
531 CULG	10	0421	0424	0429	S18	W90	1.000	15083	3.4	8	-N		C	0424	20			Y5
	10	0541	0548	NO FLARE PATROL														
532 KANZ	10	0835	0839	0845	S20	W23	.462	15093	8.6	10	-F						G	Y5
533 KANZ	10	1009		1026	S22	W24	.491	15093	8.6	17	-F						G	Y5
534 KANZ	10	1013	1016	1018	N18	W90	1.000	15095	3.7	5	-F							Y5
	10	1958	2021	NO FLARE PATROL														
	10	2118	2124	NO FLARE PATROL														
535 CULG	10	2202	2240	2330	N15	W27	.542	15092	8.9	88	1N		C	2240	180	2.2		Y5
536 PALE	11	0151	0157	0210	N18	E23	.525	15097	12.8	19	-F	3	V		25		F	Y5
537 CULG	11	0223	0225	0244	N15	W31	.590	15092	8.8	21	-F		C	0225	20	.2		Y5
GRP65538	11	0256>9	0322	0359	N15	W31	.590	15092	8.8	63	-F						G	
			0330															
CULG	11	0256	0322	0400	N14	W31	.583	15092	8.8	64	-N		C	0322	85	1.1	F	
MITK	11	0308	0330	0357	N17	W31	.605	15092	8.8	49	-F		C	0330	120	1.5	EG	
	11	0859	0902	NO FLARE PATROL														
539 ABST	11	1010	1014	1020	N19	E24	.546	15097	13.2	10	-F		C	1014	61	.7	DJ	Y5
540 ABST	11	1027	1031	1036	N18	E16	.457	15097	12.6	9	-F		C	1031	79	.9	DJ	Y5
GRP65541	11	1745	1750	1825D	N18	E13	.432	15097	12.7	40	-N						E	
			1758															
MCMA	11	1745	1750	1825D	N18	E12	.424	15097	12.6	40D	-N		C	1750	60	.7	E	
RAMY	11	1755E	1758	1800D	N18	E14	.440	15097	12.8	5D	-F	4	C		64		DE	
542 CULG	11	2150	2201	2210	N19	E11	.431	15097	12.7	20	-N		C	2201	30	.3		Y5
GRP65543	11	2239+2	2249+0	2313	N18	E10	.410	15097	12.7	34	-N				40	.4		
CULG	11	2239	2249	2320	N19	E10	.425	15097	12.7	41	-N		C	2249	30	.3		
PALE	11	2241	2249	2306	N18	E11	.417	15097	12.8	25	-N	3	C		53		DE	
544 CULG	12	0339	0343	0410	N18	E08	.400	15097	12.8	31	-F		C	0343	60	.7		Y5
GRP65545	12	0642>9	0714+6	0750	N18	E06	.391	15097	12.7	68	-F						DJ	
CULG	12	0642	0720	0752	N18	E06	.391	15097	12.7	70	-N		C	0752	40	.4		
ABST	12	0700	0714	0748	N18	E06	.391	15097	12.7	48	-F		C	0714	87	1.0	DJ	
546 ABST	12	1031	1039	1052	N19	E04	.400	15097	12.7	21	-F		C	1039	175	2.0	EJ	Y5
547 RAMY	12	1450E	1453	1459	N19	W01	.395	15097	12.5	9D	-F	3	C		60		DE	Y5
	12	1500	1512	NO FLARE PATROL														
	12	1548	1746	NO FLARE PATROL														
548 CULG	12	2220	2225	2234	N18	W03	.381	15097	12.7	14	-F		C	2225	60	.7		Y5
549 CULG	12	2235	2237	2310	N19	W03	.397	15097	12.7	35	-F		C	2237	60	.6		Y5
550 CULG	12	2325	2330	0008	N18	E04	.384	15097	13.3	43	-F		C	2330	70	.7		Y5
551 CULG	13	0311	0318	0344	S28	W18	.488	15104	11.8	33	-F		C	0318	30	.3		Y5
552 MITK	13	0317E		0325	N18	W07	.397	15097	12.6	8D	-N		C	0317	70	.8	E	Y5
553 MITK	13	0357	0400	0408	N19	W08	.417	15097	12.6	11	-N		C	0400	50	.6	E	Y5
GRP65554	13	0534	0550	0639	N19	W07	.412	15097	12.7	65	-N						FJKZ	
			0612															
CULG	13	0534	0550	0640	N19	W07	.412	15097	12.7	66	-N		C	0550	80	.9	K	
ABST	13	0605E	0612	0638	N19	W08	.417	15097	12.7	33D	1F		P	0612	218	2.5	FJZ	

Hα SOLAR FLARES

JANUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
555 ABST	13	0805	0819	0853	N19	W10	.428	15097	12.6	48	-F		C	0819	148	1.7	FJZ	Y5
556 ABST	13	0806	0817	0833	S27	W21	.504	15104	11.8	27	-N		C	0817	96	1.1	DH	Y5
GRP65557	13	0840+5	0846	0923	S27	W21	.504	15104	11.8	43	-F						H	
ABST	13	0840	0846	0923	S27	W22	.513	15104	11.7	43	-N		C	0846	105	1.3	FH	
BUCA	13	0845		0900D	S27	W20	.494	15104	11.9	150	-F		P	0855	53	.6	D	
558 ABST	13	1014	1022	1031D	S27	W22	.513	15104	11.8	170	-F		P	1022	70	.8	DH	Y5
	13	1500	1813	NO FLARE PATROL														
	13	2007	2041	NO FLARE PATROL														
	13	2104	2117	NO FLARE PATROL														
	13	2131	2152	NO FLARE PATROL														
	13	2240	2253	NO FLARE PATROL														
	13	2321	2338	NO FLARE PATROL														
	14	0011	0028	NO FLARE PATROL														
559 CULG	14	0413	0416	0445	N19	W21	.519	15097	12.6	32	-F		C	0416	20	.2		Y5
560 ABST	14	0714	0719	0725	S21	W23	.466	15104	12.6	11	-F		C	0719	105	1.2	EGJLZ	Y5
561 ABST	14	0727	0734	0742	N19	W24	.549	15097	12.5	15	-F		C	0734	61	.7	DJLZ	Y5
562 ABST	14	0814	0822	0853D	N19	W24	.549	15097	12.5	390	?F		P	0822	227	2.8	FJLZ	Y5
	IMP.1 NO KANZ1																	
GRP65563	14	0840+0	0848 1008	1032D	S21	W24	.479	15104	12.6	112	-F						DGJLZ	
KANZ	14	0840		1153	S20	W24	.471	15104	12.6	193	-F						LT	
ABST	14	0840	0848	0853D	S21	W24	.479	15104	12.6	130	-F		P	0848	96	1.1	DGJLZ	
ABST	14	1004	1008	1032	S21	W25	.491	15104	12.5	28	-F		C	1008	87	1.0	DGL	
GRP65564	14	0926+1	0927+1	0934	S28	E45	.752	15100	17.8	8	-F						DG	
ABST	14	0926	0928	0934	S28	E46	.762	15100	17.8	8	-F		C	0928	87	1.3	D	
KANZ	14	0927	0927	0933	S28	E45	.752	15100	17.8	6	-F						G	
565 ABST	14	0946	0950	0954	S30	E45	.761	15100	17.8	8	?F		C	0950	175	2.8	E	Y5
	IMP.1 NO KANZ1																	
566 ABST	14	1032	1048	1105D	N18	W26	.560	15097	12.5	330	-F		P	1048	166	2.0	FL	Y5
567 KANZ	14	1326	1333	1340	N19	W27	.580	15097	12.5	14	-F							Y5
	14	1520	1712	NO FLARE PATROL														
	14	1844	2058	NO FLARE PATROL														
	14	2137	2148	NO FLARE PATROL														
568 ABST	15	0707E	0711	0753D	N19.	W35	.666	15097	12.7	460	-F		P	0711	79	1.1	DJ	Y5
	15	2045	2157	NO FLARE PATROL														
	15	2158	2222	NO FLARE PATROL														
GRP65569	16	0258+3	0304+9	0335	S27	W58	.865	15104	11.8	37	-N				40	.8	J	
CULG	16	0258	0313	0340	S27	W58	.862	15104	11.8	42	-N		C	0313	40	.8		
VORO	16	0258	0308	0330	S27	W58	.862	15104	11.8	32	-B		C	0308	90	1.7	EJ	
MANI	16	0301	0304	0315D	S27	W58	.862	15104	11.8	140	-F	3	P		30	.5	F	
	16	0514	0524	NO FLARE PATROL														
570 CULG	16	0731	0740U	0750D	N16	W53	.832	15097	12.3	190	-F		P	0740	35	.6		Y5
571 KHAR	16	0950		1002	S22	W49	.771	15104	12.7	12	-F		V	0955	15		D	Y5
572 KHAR	16	1005	1007	1024	N18	W53	.838	15097	12.4	19	?F		P	1007	110	2.1	D	Y5
	IMP.1 NO KIEV2																	
	16	1050	1120	NO FLARE PATROL														
	16	1530	2010	NO FLARE PATROL														
GRP65573	17	0123+2	0127+1	0201	S27	E10	.410	15100	17.8	38	-N						J	
VORO	17	0123	0128	0156	S26	E11	.402	15100	17.9	33	1N		C	0128	206	2.3	EJ	
CULG	17	0125	0127	0205	S28	E10	.425	15100	17.8	40	-N		C	0127	70	.8	F	
	17	0746	0803	NO FLARE PATROL														
	17	0929	1008	NO FLARE PATROL														
	17	1020	1112	NO FLARE PATROL														

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
574 RAMY	17	1359E	1400	1428D	S27	E03	.382	15100	17.8	29D	1N	4	C		280		F Y5
	17	1510	1620	NO FLARE PATROL													
	17	1808	1816	NO FLARE PATROL													
	17	1831	2059	NO FLARE PATROL													
	17	2110	2138	NO FLARE PATROL													
	17	2141	2208	NO FLARE PATROL													
	17	2212	2220	NO FLARE PATROL													
	17	2229	2235	NO FLARE PATROL													
	17	2244	2247	NO FLARE PATROL													
	18	0002	0005	NO FLARE PATROL													
575 CULG	18	0243	0300	0330	S26	W05	.370	15100	17.7	47	-F		C	0300	40	.4	Y5
576 CULG	18	0247	0249	0303	N17	W82	.994	15097	12.0	16	-F		C	0249	30		Y5
577 CULG	18	0439	0443	0450	N17	W82	.994	15097	12.0	11	-F		C	0443	40		Y5
	18	1318	1405	NO FLARE PATROL													
	18	1415	1419	NO FLARE PATROL													
	18	1520	1734	NO FLARE PATROL													
	18	2028	2123	NO FLARE PATROL													
	19	0803	0825	NO FLARE PATROL													
	19	1140	1142	NO FLARE PATROL													
	19	1456	1505	NO FLARE PATROL													
	19	1510	1556	NO FLARE PATROL													
	19	1614	1709	NO FLARE PATROL													
	19	1803	2005	NO FLARE PATROL													
	20	0818	0825	NO FLARE PATROL													
	20	1800	1806	NO FLARE PATROL													
578 PALE	21	0100	0101	0104	S27	W41	.704	15100	18.0	4	-F	3	C		26		DE Y5
579 ABST	21	0605E	0607	0620D	S24	W39	.669	15100	18.3	15D	-F		P	0607	87	1.2	DJ Y5
	21	0812	0813	NO FLARE PATROL													
580 ABST	21	0838	0845	0911D	S24	W42	.702	15100	18.2	33D	-F		P	0845	122	1.8	EJ Y5
581 ABST	21	0840	0845	0911D	S24	W51	.793	15100	17.5	31D	-F		P	0845	79	1.3	DJ Y5
	21	1310	1419	NO FLARE PATROL													
582 RAMY	21	1438E	1440U	1458D	S24	W44	.723	15100	18.3	20D	-N	4	C		32		Y5
583 HTPR	21	1516		1526D	S23	W44	.720	15100	18.3	10D	-F		C	1517	30	.4	Y5
	21	1526	1736	NO FLARE PATROL													
584 PALE	21	1844	1845	1856	S24	W46	.744	15100	18.3	12	-F	3	C		30		F Y5
585 PALE	21	2134	2139	2145	S24	W48	.764	15100	18.3	11	-F	3	C		29		F Y5
586 PALE	21	2155	2203	2214D	S24	W48	.764	15100	18.3	19D	-F	3	C		75		DE Y5
	21	2214	2218	NO FLARE PATROL													
	21	2222	2234	NO FLARE PATROL													
	21	2258	2300	NO FLARE PATROL													
587 VORO	22	0247	0249	0252	N22	E66	.940	15113	27.1	5	-B		C	0249	63	1.8	D Y5
588 CULG	22	0536	0550	0600	S22	W53	.808	15100	18.3	24	-F		C	0550	40	.7	T Y5
GRP65589	22	0634	0641+0 0655+4	0706	S22	W54	.817	15100	18.2	32	-B				70	1.3	DJKRZ
ABST	22	0634	0659	0707	S22	W55	.826	15100	18.1	33	-B		C	0659	105	1.8	DJRZ
ABST	22	0636	0641	0650	S24	W59	.863	15100	17.9	14	-F		C	0641	87	1.7	DJ
MITK	22	0640E	0641	0645	S22	W54	.817	15100	18.2	5D	-N		P	0641	50	.9	D
CULG	22	0642E	0655	0711	S22	W53	.808	15100	18.3	29D	-N		C	0655	60	1.1	TK
MITK	22	0654	0659	0705	S22	W54	.817	15100	18.2	11	-B		C	0659	50	.9	D
590 ABST	22	0815	0825	0852	S23	W54	.819	15100	18.3	37	-N		C	0825	114	2.0	DJZ Y5
GRP65591	22	1024+1	1026+4	1048	S22	W57	.844	15100	18.2	24	-F						DHJZ
ABST	22	1024	1030	1052	S22	W58	.852	15100	18.1	28	-F		C	1030	87	1.6	DJZ
KHAR	22	1025	1026	1044	S22	W56	.835	15100	18.2	19	-F		V	1026			H

Hα SOLAR FLARES

JANUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
					APPROX		CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY									
	DATE JAN	START	MAX. PHASE	END	LAT.	MER. DIST.				MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
592 PALE	22	1818	1843	1904	S24	W60	.871	15100	18.3	46	-F	3	C		37		F	Y5
593 PALE	22	1920	1925	2019	S26	W60	.873	15100	18.3	59	-F	3	C		85		F	Y5
594 PALE	22	2023	2024	2042	S23	W61	.877	15100	18.3	19	-F	3	C		79		F	Y5
595 PALE	22	2049	2054	2200	S24	W60	.871	15100	18.4	71	-F	3	C		58		F	Y5
GRP65596	22	2231>9	2308 2336	2351	S23	W63	.892	15100	18.2	80	-F							
PALE	22	2231	2308	2356	S23	W63	.892	15100	18.2	85	-F	3	C		48		F	
MITK	22	2334	2336	2345	S23	W64	.899	15100	18.2	11	-N		C	2336	80	1.8	D	
597 CULG	23	0004	0006	0020	N23	E72	.969	15113	28.4	16	-N		C	0006	40			Y5
GRP65598	23	0004>9	0018 0028	0032	S23	W63	.892	15100	18.3	28	-F							
PALE	23	0004	0018	0035	S23	W63	.892	15100	18.3	31	-F	3	C		31		F	
MITK	23	0026	0028	0029	S23	W64	.899	15100	18.2	3	-N		C	0028	60	1.4	E	
GRP65599	23	0049>9	0127+0	0132	S23	W64	.899	15100	18.2	43	-F				45			
PALE	23	0049	0127	0132	S23	W64	.899	15100	18.2	43	-F	3	C		41		F	
MITK	23	0126	0127	0131	S23	W65	.906	15100	18.2	5	-F		C	0127	50	1.2	D	
GRP65600	23	0251+1	0253+0	0303	S24	W63	.893	15100	18.4	12	-N				60	1.4		
VORO	23	0251	0253	0258	S25	W62	.887	15100	18.5	7	-B		C	0253	72	1.5	D	
PALE	23	0252	0253	0308	S23	W65	.906	15100	18.2	16	-F	3	C		59		F	
601 PALE	23	0332	0333	0337	S23	W65	.906	15100	18.3	5	-F	3	C		54		F	Y5
602 CULG	23	0355	0412	0450	S22	W56	.835	15100	19.0	55	-F		C	0412	60	1.5	T	Y5
603 ABST	23 IMP-1 NO	0729E TACH1	0729	0815D	S23	W68	.925	15100	18.2	46D	?F		P	0729	166		BEKZ	Y5
	23	1620	1747	NO FLARE PATROL														
	23	1804	1853	NO FLARE PATROL														
	23	1854	1910	NO FLARE PATROL														
	23	1923	1935	NO FLARE PATROL														
	23	2017	2250	NO FLARE PATROL														
GRP65604	24	0621+1	0622+2	0630	N19	E25	.569	15112	26.1	9	-F				35	.4		
CULG	24	0621	0622	0631	N19	E26	.579	15112	26.2	10	-N		C	0622	40	.5		
MANI	24	0622	0624	0629	N20	E25	.578	15112	26.1	7	-F	3	P		30	.3		
605 LVOV	24	1202	1207	1220	N19	E22	.539	15112	26.2	18	1F		C	1207	200	2.4	DJ	Y5
606 KANZ	24	1359E		1359D	N18	E18	.490	15112	25.9		-F						D	Y5
	24	1815	1825	NO FLARE PATROL														
	24	2048	2055	NO FLARE PATROL														
GRP65607	25	0216+3	0221	0232D	N19	E09	.439	15112	25.8	16	-F						FK	
CULG	25	0216	0235	0305	N19	E11	.450	15112	25.9	49	-N		C	0226	80	.9	FK	
MANI	25	0219	0221	0232	N20	E08	.449	15112	25.7	13	-F	3	P		30	.3	F	
608 CULG	25	0346	0350	0354D	N19	E12	.457	15112	26.1	8D	-F		C	0350	20	.2		Y5
GRP65609	25	0627+2	0630+1	0727	N19	E10	.444	15112	26.0	60	-N				80	.9	DJ	
ABST	25	0627	0631	0727	N19	E11	.450	15112	26.1	60	-N		C	0631	87	1.0	DJ	
MITK	25	0629	0630	0640D	N20	E10	.459	15112	26.0	11D	-B		C	0630	70	.8	D	
610 ABST	25	0735	0739	0751	S28	E90	.999	15124	1.1	16	1F		C	0739	87		ADJ	Y5
611 CATA	25	0835E	0835	0845D	S28	E90	.999	15124	1.1	10D	-F	1		0835	28			Y5
612 KANZ	25	0920		0931	S27	E90	.999	15124	1.1	11	-F							Y5
613 KANZ	25	0947E		0949	S27	E90	.999	15124	1.2	2D	-F							Y5
614 KANZ	25	1203E		1205	S28	E90	.999	15124	1.3	2D	-F							Y5
615 KANZ	25	1354	1400	1404	S28	E90	.999	15124	1.3	10	-F							Y5
616 RAMY	25	1647E	1650U	1705	N20	E02	.431	15112	25.8	18D	-F	3	C		32		F R	Y5
	25	1920	1950	NO FLARE PATROL														

Hα SOLAR FLARES

JANUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
617 PALE	25	1950E	2000U	2017D	N19	E82	.415	15112	26.0	27D	-F	3	C		45		F	Y5
	25	2018	2034	NO FLARE PATROL														
	25	2138	2356	NO FLARE PATROL														
	26	0021	0035	NO FLARE PATROL														
GRP65618	26	0053E	0055	0210D	S28	E83	.988	15124	4.3	77	1F							
			0207															
PALE	26	0053E	0055	0210D	S28	E83	.988	15124	1.3	77D	-F	3	C		57		FOE	
PALE	26	0053E	0207	0210D	S28	E83	.988	15124	1.3	77D	1F	3	C		85		FOE	
	26	0230	0239	NO FLARE PATROL														
619 CULG	26	0243	0247U	0337D	S28	E85	.993	15124	1.5	54D	1N		C	0247	150			Y5
620 CULG	26	0431	0440	0508	S27	E86	.994	15124	1.6	37	1N		C	0440	150			Y5
GRP65621	26	0535	0548	0657	S30	E83	.988	15124	4.5	82	1N						DJK	
			0640+7															
CULG	26	0535	0548	0640	S30	E90	.999	15124	2.0	65	1N		C	0548	160		K	
ATHN	26	0610E	0640	0742	S31	E80	.980	15124	1.3	92D	1N	1		0640	82	3.3		
TACH	26	0638	0647	0657	S28	E83	.988	15124	1.5	19	-N		C	0647	62		DJT	
622 CULG	26	0636	0640	0723D	N18	W04	.405	15112	26.0	47D	-F		C	0640	120	1.3		Y5
GRP65623	26	0857+0	0900+4	0924	N18	W05	.408	15112	26.0	27	-F						E	
HTPR	26	0857	0900	0924	N18	W07	.415	15112	25.8	27	-F		C	0900	10	.1		
MONT	26	0857	0904	0920D	N19	W03	.418	15112	26.1	23D	-F		C	0904	60		E	
624 KANZ	26	1003	1003	1007	N19	W06	.427	15112	26.0	4	-F						E	Y5
GRP65625	26	1011+0	1013+1	1022	S25	E83	.989	15124	4.6	11	-F						D	
KANZ	26	1011	1014	1021	S26	E79	.977	15124	1.3	10	-F				60			
ABST	26	1011	1013	1021	S25	E84	.991	15124	1.7	10	1F		C	1013	90		D	
HTPR	26	1011	1014	1021	S26	E80	.980	15124	1.4	10	-F		C	1014	20			
MONT	26	1020E	1025	1025D	S25	E83	.989	15124	1.7	5D	-N		C		40		D	
CATA	26	1020E	1020	1025	S25	E90	.999	15124	2.2	5D	1N	1		1020	56			
GRP65626	26	1030+2	1035+1	1043	S26	E82	.986	15124	4.6	13	-N				70		ADK	
ABST	26	1030	1035	1042	S26	E87	.996	15124	2.0	12	1N		C	1035	96		DKA	
KANZ	26	1032	1036	1042	S26	E80	.980	15124	1.4	10	-N							
HTPR	26	1032	1036	1043	S26	E80	.980	15124	1.4	11	-F		C	1036	30			
MONT	26	1038E	1038	1046	S25	E83	.989	15124	1.7	8D	-N		C	1038	70		D	
GRP65627	26	1031+4	1037	1101	N20	W07	.446	15112	25.9	30	-F				60	.7	AK	
			1043+0															
HTPR	26	1031	1043	1105	N20	W08	.450	15112	25.8	34	-F		C	1043	40	.4	E	
ABST	26	1032E	1037	1049D	N20	W06	.442	15112	26.0	17D	-F		P	1037	79	.9	DKA	
KANZ	26	1035	1043	1056	N21	W06	.457	15112	26.0	21	-F							
GRP65628	26	1052+2	1057	1118	S26	E80	.980	15124	4.5	26	-F						E	
			1107+1															
MONT	26	1052	1108	1118	S25	E83	.989	15124	1.7	26	-F		C	1108	40		E	
KANZ	26	1053	1107	1121	S26	E78	.974	15124	1.3	28	-F							
HTPR	26	1054	1057	1110	S26	E80	.980	15124	1.5	16	-F		C	1057	10			
GRP65629	26	1125+3	1131+0	1146	S27	E81	.983	15124	4.6	21	-N						E	
KANZ	26	1125	1131	1148	S27	E80	.980	15124	1.5	23	-N							
MONT	26	1125	1131	1146	S26	E82	.986	15124	1.6	21	-N		C	1131	60		E	
HTPR	26	1128	1131	1137	S28	E80	.980	15124	1.5	9	-F		C	1131	20			
GRP65630	26	1247+0	1248+1	1252	S32	E84	.990	15124	4.8	5	-F						D	
MONT	26	1247	1249	1253	S33	E85	.992	15124	1.9	6	-F		C	1249	40		D	
KANZ	26	1247	1248	1251	S31	E83	.988	15124	1.8	4	-F							
GRP65631	26	1325+1	1327	1350	S26	E80	.980	15124	4.6	25	-F							
			1344+1															
MONT	26	1325	1327	1331	S25	E82	.986	15124	1.7	6	-F		C	1327	20		D	
KANZ	26	1326	1345	1351	S25	E80	.980	15124	1.6	25	-F							
HTPR	26	1339	1344	1350	S27	E79	.977	15124	1.5	11	-N		C	1344	60		E	
632 PALE	26	1826	1826	1833	S33	E71	.946	15124	1.1	7	-F	3	C		30		DE	Y5
633 PALE	26	1845	1845	1859	S30	E75	.962	15124	1.4	14	-F	3	C		50		DE	Y5
634 PALE	26	1954	1954	2001	S33	E75	.963	15124	1.5	7	-F	3	C		21		DE	Y5

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY			CONC.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
	JAN									MIN.							
635 PALE	26	2017	2018	2026	S33	E75	.963	15124	1.5	9	-F	3	C		41		DE Y5
636 PALE	26	2029	2031	2053	S33	E75	.963	15124	1.5	24	-N	3	C		45		DE Y5
637 PALE	26	2121	2127	2137	S33	E74	.959	15124	1.4	16	1N	3	C		115		DE F Y5
GRP65638	26	2251+0	2251+0	2259	N19	W15	.480	15112	25.8	8	-F				40	.4	F
PALE	26	2251	2251	2259	N19	W15	.480	15112	25.8	8	-F	3	C		40		F
PALE	26	2251	2251	2259	N19	W15	.480	15112	25.8	8	-F	3	V		40		F
639 PALE	26	2312	2313	0020	N19	W14	.472	15112	25.9	68	-N	3	C		71		FDE Y5
GRP65640	26	2316+0	2316+0	2319	S30	E73	.954	15124	4.4	3	-F				20		F
PALE	26	2316	2316	2319	S30	E73	.954	15124	1.4	3	-F	3	C		22		F
PALE	26	2316	2316	2319	S30	E73	.954	15124	1.4	3	-F	3	V		22		F
641 PALE	26	2357	2417	0021D	S28	E84	.991	15124	2.3	24D	-F	3	C		47		DE Y5
642 PALE	27	0116	0117	0123	S27	E73	.953	15124	1.5	7	-F	3	V		27		F Y5
643 PALE	27	0147	0148	0202	S27	E73	.953	15124	1.5	15	-F	3	V		31		F Y5
644 PALE	27	0231	0232	0236	S27	E73	.953	15124	1.6	5	-F	3	V		18		F Y5
645 VORO	27	0312	0314	0322	S31	E75	.962	15124	1.8	10	-B		C	0314	36	1.4	D Y5
GRP65646	27	0328+1	0334+0	0352	N19	E90	1.001	15126	5.9	24	1F				120		
MITK	27	0328	0334	0354	N19	E90	1.001	15126	2.9	26	1N		C	0334	100		
VORO	27	0329	0334	0349	N19	E90	1.001	15126	2.9	20	1F		C	0334	152		
GRP65647	27	0351+2	0357+1	0411	S30	E75	.962	15124	4.8	20	1N				100		DJ
VORO	27	0351	0357	0410	S30	E74	.958	15124	1.7	19	1N		C	0357	116	4.1	DJ
MITK	27	0353	0358	0412	S30	E77	.970	15124	1.9	19	1N		C	0358	90		
648 MITK	27	0511	0518	0529	S32	E72	.950	15124	1.6	18	1N		C	0518	80		D Y5
GRP65649	27	0842+4	0850+1	0900	S31	E71	.945	15124	4.7	18	-N						
KANZ	27	0842	0850	0900	S31	E71	.945	15124	1.7	18	-N						
MONT	27	0846	0851	0900	S32	E72	.950	15124	1.8	14	1N		C	0851	200		
GRP65650	27	0855+1	0856+0	0902	S26	E69	.932	15124	4.5	7	-F						D
MONT	27	0855	0856	0900	S25	E70	.937	15124	1.6	5	-F		C	0856	20		D
KANZ	27	0856	0856	0903	S27	E68	.926	15124	1.5	7	-F						
GRP65651	27	0949+0	0952+2	0959	N19	W20	.523	15112	25.9	10	-F						E
KANZ	27	0949	0954	0958	N19	W19	.514	15112	26.0	9	-F						
MONT	27	0949	0952	1000	N19	W21	.532	15112	25.8	11	-F		C	0952	60		E
GRP65652	27	1021+0	1025+2	1047	N19	E90	1.001	15126	6.2	26	-N						W
MONT	27	1021	1025	1047	N19	E90	1.001	15126	3.2	26	-N		C	1025	70		W
KANZ	27	1021	1027	1047	N19	E90	1.001	15126	3.2	26	-N						
CATA	27	1030E	1030	1055	N17	E90	1.000	15126	3.2	250	2N	1		1030	196		
GRP65653	27	1413+2	1415+5	1434	N19	E90	1.001	15126	6.3	21	-N						
KANZ	27	1413	1420	1427	N20	E90	1.001	15126	3.3	14	-N						
CATA	27	1415	1415	1440	N18	E90	1.000	15126	3.3	25	1N	1		1415	67		
654 PALE	27	1813	1815	1815	S17	E60	.863	15123	1.3	2	-F	3	C		15		DE Y5
655 PALE	27	1837	1838	1854	S17	E59	.855	15123	1.2	17	-N	3	C		111		DE Y5
656 PALE	27	1838	1839	1856	S32	E68	.930	15124	1.9	18	-F	3	C		39		DE Y5
657 PALE	27	1940	1940	1946	S32	E67	.924	15124	1.8	6	-F	3	C		15		DE Y5
658 PALE	27	2023	2025	2027	S32	E67	.924	15124	1.9	4	-F	3	C		24		DE Y5
GRP65659	27	2037	2040+6	2057	S16	E60	.863	15123	4.4	20	-F						
PALE	27	2037	2040	2103	S17	E58	.846	15123	1.2	26	-F	3	C		25		DE
RAMY	27	2044E	2046	2050	S16	E62	.879	15123	1.5	6D	-F	3	C		80		
660 VORO	28	0146	0152	0202	N14	W33	.619	15112	25.6	16	-B		C	0152	125	1.6	EJ Y5
661 VORO	28	0248	0250	0303	N23	W27	.629	15112	26.1	15	-B		C	0250	54	.7	EJ Y5

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
GRP65662	28	0447+3	0448 0455	0506	S18	E13	.304	15115	29.2	19	-N						EH
VORO	28	0447	0448	0459D	S18	E13	.304	15115	29.2	12D	-B		C	0448	63	.6	EH
MANI	28	0450	0455	0506	S19	E13	.315	15115	29.2	16	-F	3	P		40	.4	H
663 ABST	28	0745E	0748	0754D	S17	E54	.809	15123	1.4	9D	-F		P	0748	35	.6	DJ Y5
664 ABST	28	0810E	0813	0831	N17	W35	.661	15112	25.7	21D	-F		P	0813	44	.6	DJ Y5
665 ABST	28	0908	0910	0915	N16	E62	.907	15125	2.0	7	-F		C	0910	70	1.6	EJ Y5
666 ABST	28	0952E	0956	1032D	N18	W34	.657	15112	25.9	40D	-F		P	0956	79	1.1	DGJ Y5
	28	1250	1314	NO FLARE PATROL													
	28	1330	1755	NO FLARE PATROL													
667 PALE	28	1818	1819	1825	N18	W39	.710	15112	25.8	7	-F	3	C		19		DE Y5
	28	1838	1901	NO FLARE PATROL													
668 PALE	28	1910	1912	1916	S30	E51	.806	15124	1.6	6	-F	3	C		20		DE Y5
	28	1935	1944	NO FLARE PATROL													
669 PALE	28	1944E	1954	2033	N18	W41	.730	15112	25.7	49D	-F	3	C		87		DE F Y5
GRP65670	28	1949	1949+2	1959	S18	E46	.726	15123	4.3	10	-F						E
PALE	28	1949	1949	1959	S18	E46	.726	15123	1.3	10	-F	3	C		24		DE
PALE	28	1949	1951	1959	S18	E46	.726	15123	1.3	10	-F	3	C		24		DE
671 PALE	28	1958	2002	2022	S30	E50	.797	15124	1.6	24	-F	3	C		91		DE F Y5
	28	2042	2135	NO FLARE PATROL													
	28	2138	2159	NO FLARE PATROL													
672 PALE	28	2222	2224	2247	N20	W40	.731	15112	25.9	25	-F	3	C		101		DE Y5
673 CULG	29	0549	0551	0610	N24	W41	.764	15112	26.2	21	-N		C	0551	80	1.2	Y5
	29	0728	0735	NO FLARE PATROL													
	29	0803	0810	NO FLARE PATROL													
	29	0915	0925	NO FLARE PATROL													
	29	1005	1035	NO FLARE PATROL													
	29	1038	1041	NO FLARE PATROL													
674 ABST	29	1040E	1043	1054D	N23	E70	.962	15126	3.7	14D	-F		P	1043	87		DJ Y5
	29	1054	1059	NO FLARE PATROL													
	29	1100	1110	NO FLARE PATROL													
	29	1140	1358	NO FLARE PATROL													
	29	1401	1407	NO FLARE PATROL													
	29	1413	1434	NO FLARE PATROL													
	29	1438	1508	NO FLARE PATROL													
	29	1640	1712	NO FLARE PATROL													
	29	1739	1936	NO FLARE PATROL													
	29	2000	2009	NO FLARE PATROL													
675 PALE	29	2027E	2027U	2045	S17	E31	.535	15123	1.2	18D	-F	3	C		24		F Y5
	29	2030	2043	NO FLARE PATROL													
	29	2045	2156	NO FLARE PATROL													
	29	2213	2255	NO FLARE PATROL													
GRP65676	30	0138+1	0140+3	0219	S30	E35	.654	15124	4.7	41	1N				220	3.0	F
MANI	30	0138	0143	0211D	S31	E36	.670	15124	1.8	33D	1N	3	P		160	2.2	F
PALE	30	0139	0140	0219	S29	E34	.637	15124	1.6	40	1N	3	C		287		F
677 ABST	30	0736E	0741	0752	N17	W62	.909	15112	25.7	16D	-F		P	0741	79	1.8	DJ Y5
678 ABST	30	1004	1006	1010D	N17	E53	.840	15126	3.4	6D	-F		P	1006	70	1.3	DJZ Y5
679 HTPR	30	1249	1250	1253	N14	W67	.936	15112	25.5	4	-N		C	1250	30	.7	Y5
680 HTPR	30	1305	1308	1311	N13	W67	.935	15112	25.5	6	-F		C	1308	10	.2	Y5
	30	1356	1408	NO FLARE PATROL													
	30	1424	1445	NO FLARE PATROL													

Hα SOLAR FLARES

JANUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		CONG	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	30	1447	1544	NO FLARE PATROL														
	30	1548	1603	NO FLARE PATROL														
	30	1954	2151	NO FLARE PATROL														
	30	2232	2300	NO FLARE PATROL														
GRP65681	31	0152+2	0157 0206	0211	N18	E41	.731	15126	6.2	19	-N						J	
HITK	31	0152	0157	0200	N19	E41	.737	15126	3.2	8	-N		C	0157	60	.9	D	
VORO	31	0154	0206	0221	N18	E42	.741	15126	3.2	27	-B		C	0206	63	.9	EJ	
	31	0507	0522	NO FLARE PATROL														
	31	0528	0533	NO FLARE PATROL														
682 ABST	31	0659E	0702	0741D	N20	E39	.723	15126	3.2	42D	1F		P	0702	227	3.4	FJ	Y5
GRP65683	31	0702+1	Q707 0716	0737	S32	E20	.531	15124	4.8	35	-N				140	1.7	JK	
ABST	31	0702	0707	0733	S31	E18	.503	15124	1.6	31	-F		C	0707	140	1.7	DJ	
ABST	31	0703	0716	0741D	S32	E23	.556	15124	2.0	38D	1N		P	0716	227	2.8	FJK	
CATA	31	0710E	0710	0715D	S33	E20	.542	15124	1.8	5D	-B	2		0710	140	1.7		
GRP65684	31	0837	0837+3	0853	N19	E39	.717	15126	6.3	16	-F						JZ	
KANZ	31	0837	0837	0849	N19	E39	.717	15126	3.3	12	-F						E	
ABST	31	0838E	0840	0854D	N21	E39	.729	15126	3.3	16D	-F		P	0840	87	1.3	DJZ	
HTPR	31	0844E		0853	N18	E39	.711	15126	3.3	9D	-F		C	0847	20	.2		
GRP65685	31	0919>9	0937+4	0945D	N20	E38	.713	15126	6.2	26	-F						DK	
KANZ	31	0919	0941	0945	N19	E38	.707	15126	3.2	26	-F						D	
ABST	31	0930	0937	1059D	N21	E39	.729	15126	3.3	89D	-F		P	0937	87	1.3	DK	
GRP65686	31	1021>9	1035 1046	1052	N16	W81	.993	15112	25.4	31	-F						ADJ	
KANZ	31	1021	1035	1045	N16	W78	.985	15112	25.6	24	-F							
ABST	31	1042	1046	1059D	N16	W85	.998	15112	25.1	17D	-F		P	1046	87		ADJ	
GRP65687	31	1232	1237+1	1245	N18	E37	.690	15126	6.3	13	-F						E	
HTPR	31	1232	1238	1242	N18	E37	.690	15126	3.3	10	-F		C	1238	30	.4	E	
KANZ	31	1233E	1237	1247	N19	E37	.697	15126	3.3	14D	-F							
688 KANZ	31	1301	1315	1326	N17	W78	.986	15112	25.7	25	-F							Y5
GRP65689	31	1328+1	1330+0	1339	N18	E36	.680	15126	6.3	11	-F						E	
HTPR	31	1328	1330	1338	N18	E37	.690	15126	3.3	10	-F		C	1330	50	.6	E	
KANZ	31	1329	1330	1339	N18	E35	.669	15126	3.2	10	-F							
690 HTPR	31	1402	1412	1435	N18	E35	.669	15126	3.2	33	-F		C	1412	50	.6	E	Y5
	31	1430	1445	NO FLARE PATROL														
	31	1558	1732	NO FLARE PATROL														
691 PALE	31	2101	2103	2106	N18	W88	1.000	15112	25.3	5	-F	3	C		18		F	Y5

"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

JANUARY 1978

DAILY FLARE INDICES
Includes all Flares

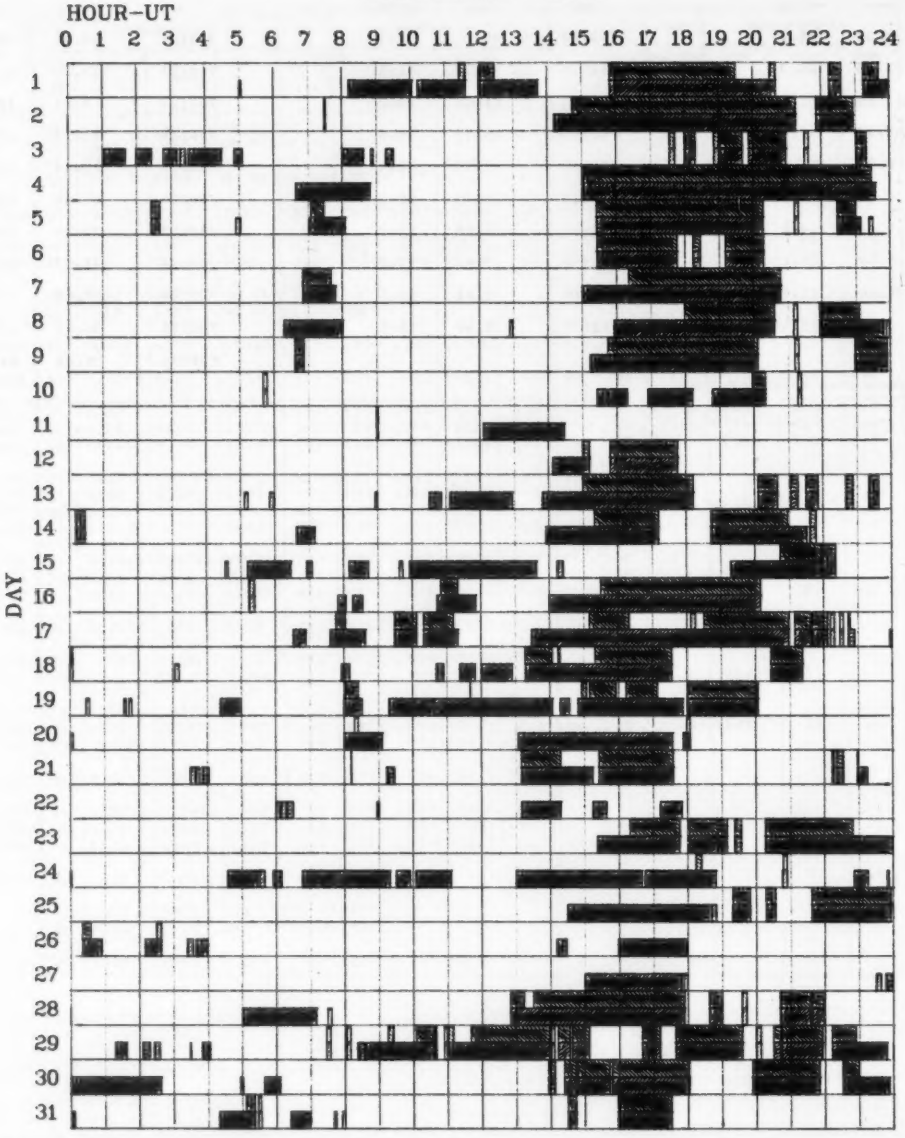
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
780101	436.01	16.7	780111	28.29	24.0	780121	19.84	20.4
780102	61.25	16.3	780112	39.32	21.6	780122	13.35	24.0
780103	212.36	21.2	780113	41.65	19.2	780123	9.01	16.7
780104	44.42	15.6	780114	25.37	19.4	780124	21.12	23.7
780105	28.29	17.9	780115	1.93	22.4	780125	33.34	20.9
780106	30.61	20.3	780116	5.73	18.7	780126	51.99	23.6
780107	49.08	18.8	780117	35.59	17.2	780127	31.46	24.0
780108	220.47	20.1	780118	7.46	20.0	780128	37.57	17.4
780109	25.66	18.3	780119	0.00	19.7	780129	7.99	14.8
780110	28.29	23.4	780120	0.00	23.8	780130	34.42	17.8
						780131	35.92	21.9

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

JANUARY 1978



Observatories included in total patrol:

Abastumani	Haute Provence	Kanzelhohe	Lvov	Palehua	Voroshilov
Athenes	Herstmonceux	Kharkov	Manila	Ramey	Wendelstein
Bucharest	Huancayo	Kiev	McMath-Hulbert	Tashkent	Zürich
Catania	Istanboul	Kodaikanal	Mitaka	Tehran	
Culgoora	Kandilli	Locarno	Monte Mario	Upice	

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
1	5730	IRKU	3 S	0556	0558.4	4	14			L
	2695	ATHN	3 S	0557.8	0558.4	7.4	13.8	4.1		
	4995	ATHN	3 S	0557.8	0558.3	12.2	26.6	8		
	8800	ATHN	3 S	0558.2	0558.8	4.4	21	6.3		
	100	HIRA	7 C	0603.5	0604.5	1	450	200		WL
	500	HIRA	46 C	0604	0608	24	17	5		O
	200	HIRA	27 RF	0606	0609.5	13	10	3		O
	100	HIRA	7 C	0608.2	0609.8	2	600	150		O
	100	HIRA	42 F	0638	0639	2	300	100		WL
	260	ONDR	44 NS	0800 E		360 D	22	3		
	245	SGMR	44 NS	1218 E	1739	538 D	61.2			
	410	SGMR	44 NS	1218 E	1736.8	538 D	22.5			
	9100	ARCE	25 R	0903.1		21				
	8800	ATHN	3 S	0917.9	0920.8	8.9	21	6.3		
	1470	BERL	1 S	0919.3	0919.7	2.2	5			
	3000	BERL	1 S	0919.3	0920.1	1.7	6			
	9500	BERL	1 S	0919.5	0920.2	1.5				
	1420	ARCE	40 F	0919.6	0920.1	2.2				
	4995	ATHN	3 S	0919.6	0920.8	1.7	16.9	5.1		
	930	BORD	41 F	0919.7	0920.2	2	102	2		
	2695	ATHN	1 S	0920.1	0920.5	7	6.9	2.1		
	9100	ARCE	3 S	0920.3	0920.8	2				
	1415	ATHN	3 S	0920.4	0920.5	2.4	19.6	5.9		
	9100	GORK	2 S/F	0920.6	0921	1	16.3	4.4		
	9100	GORK	29 PBI	0920.6	0937.3	37	8.9	4.1		
	6100	KISV	29 PBI	0920	0921	40	16			
	9100	ARCE	20 GRF	0925.9	0936.4	162				
	930	BORD	41 F	1010.7	1011	.3	72	2		
	1420	ARCE	4 S/F	1035.2	1035.5	.5				
	930	BORD	41 F	1035.7	1035.7	.9	72	2		
	1420	ARCE	2 S/F	1104.6	1104.9	.6				
	930	BORD	41 F	1105	1105.7	2.7	66	2		
	1420	ARCE	4 S/F	1107	1107.4	.6				
	8800	ATHN	3 S	1212.3	1214	4.1	13.7	4.1		
	2800	OTTA	45 C	1502.3	1503	4.7	5	1.2		
	2800	OTTA	20 GRF	1520	1524	40	3.2	1.6		
	2800	OTTA	21 GRF	1615	1636	65	4.4	2		
	2800	OTTA	1 S	1634.5	1635.1	1.5	3.8	1.9		
	2695	BOUL	1 S	1636	1636.5	1	3	1		
	2800	OTTA	40 F	1735	1736.5	3	2.6			
	2800	OTTA	20 GRF	1800	1814	38	2.4	1.2		
	2800	OTTA	20 GRF	1845	1915	90	4	2		
	4995	BOUL	2 SF	1941	1943	2	11	4		
	2695	BOUL	1 S	1943.5	1945.5	1.5	4	1		
	2695	PENT	20 GRF	2020	2030	60	1	0.5		
	9400	HUAN	20 GRF	2031.6	2124.5	52.9	16.3	3.1		O
	9400	HUAN	28 PRE	2135.7	2147.7	12	16.3	4.9		L
	9400	HUAN	45 C	2147.7	2206.8	19.1				L
	9400	HUAN	29 PBI	2206.8	2219.7	12.9	65.1	44.8		L
	1420	BOUL	47 GB	2137.5	2149	91 D	239	65		
	2695	PENT	47 GB	2138.5	2152	48	650	145		
	2800	OTTA	29 PBI	2226.5	2226.5	30	18			
	2695	BOUL	47 GB	2139.5	2154	100 D	544	82		
	4995	BOUL	47 GB	2144.5	2156.5	69.5	496	27		
	100	HIRA	48 C	2150 E		310 D	1200 D			WL
	200	HIRA	48 C	2150 E		70 D				HR
	1415	MANI	3 S	2235.5	2236.7	2.3	138	70.8		
	208	VORO	44 NS	2300	0105	360	27	15		
	200	HIRA	27 RF	2320	0025	130	40	10		HR
2	200	GORK	43 NS	0630		267		5		
	100	GORK	44 NS	0630 E		270		5		
	127	TORN	44 NS	0740 E	0956.3	410 D	75			V=2
	260	ONDR	44 NS	0820 E		347 D	50	5		
	245	SGMR	44 NS	1218 E	1530.5	539 D	37.4			3,CONT
	410	SGMR	44 NS	1218 E	1639	539 D	45			3,CONT
	8800	MANI	21 GRF	0701.8	0702.1	.8	131.2	40.2		
	1415	MANI	3 S	0702.3	0702.4	.2	7.1	4.3		
	8800	MANI	8 S	0702.3	0702.3	.1	1850	900		
	202	IZMI	41 F	0723.8	0724.2	11.7	155			
	606	MANI	3 S	0816.9	0817.8	1.5	17.1	8		
	1415	MANI	3 S	0817.5	0817.8	.6	2.8	1.4		
	2695	MANI	3 S	0817.5	0817.8	.6	4	2		
	127	TORN	45 C	0820.9	0821.1	2	155	100		
	6100	KISV	2 S/F	0947	0948	3	4			
	237	TRST	41 F	1158.6	1158.8	.4	110			O
	2800	OTTA	20 GRF	1552	1602	20	1.6	0.8		
	2800	OTTA	20 GRF	1725	1733	30	3.2	1.6		
	2800	OTTA	20 GRF	1920	1940	55	2	1		
	4995	BOUL	8 S	1941.5	1943.5	2	24	8		
	2695	BOUL	2 SF	1943.5	1944	1.5	4	1		
	2695	PENT	20 GRF	2022	2050	90	2.4	1.2		
3	200	HIRA	8 S	0308	0308.5	.8	500	50		O

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	100	HIRA	8 S	0308	0308.2	.5	1100	150		WL
	200	HIRA	8 S	0359.5	0359.7	.5	45	15		O
	5730	IRKU	1 S	0543	0543.8	3	10			L
	100	GORK	44 NS	0624 E		96		5		
	127	TORN	44 NS	0748 E		420 D				V=1
	260	ONDR	44 NS	0830 E		328 D	48			
	100	GORK	43 NS	0951		129		200		
	245	SGMR	44 NS	1218 E	1624.5	539 D	288			4,CONT
	410	SGMR	44 NS	1218 E	1534.4	539 D	18.9			4,CONT
	6100	KISV	45 C	0646	0648	14	4			
	9100	GORK	20 GRF	0729.3	0739.4	36.9	13	5.6		
	6100	KISV	4 S/F	0815	0816	5	2			
	3100	GRIM	1 S	0839	0842	6	6	2		
	127	TORN	7 C	0914.4	0915.3	1.5	45	15		
	100	GORK	45 C	0915	0915.3	.9	35			
	100	GORK		0915.5			35			
	237	TRST	41 F	0915.3	0915.4	.7	40			6L
	100	GORK	41 F	0936	0936.5	14	30			
	100	GORK		0936	0946.5		28			
	100	GORK		0936	0949.4		25			
	127	TORN	7 C	0946.3	0947.3	2	70	12		
	1420	ARCE	1 S	0957.1	0957.3	.6				
	930	BORO	46 C	1011	1017.6	22	147	20		
	408	TRST	49 GB	1014	1018.7	19.5	140 D			
	650	GORK	23 GRF	1014.6		77				
	234	POTS	45 C	1014	1048	234	700			
	3100	GRIM	7 C	1015.5	1017	7	24	8		
	3100	GRIM		1015.5	1019		45	15		
	3100	GRIM	29 PBI	1015.5	1023	16	18			
	260	ONDR	49 GB	1015.5		45	216 D	59		
	2695	ATHN	20 GRF	1015.7	1019.6	19.9	471	283		
	808	ONDR	45 C	1015.8	1018.3	18	162	35		
	4995	ATHN	20 GRF	1016.3	1019.7	19.3	24.2	14.5		
	237	TRST	47 GB	1016.4	1022.3	6.9	725			29L
	1470	BERL	4	1016.5	1018.8	35	73			
	1420	ARCE	46 C/F	1016.8	1019.1	13.2				
	1420	ARCE		1016.8	1018.3	1.9				
	1420	ARCE		1018.7	1019.1	4.3				
	1420	ARCE		1023	1023.5	3.3				
	1420	ARCE		1026.3	1027.1	3.7				
	1420	ARCE	30 PBI	1030		50				
	536	ONDR	46 C	1016.8	1018.2	35	130	15		
	3000	BERL	4	1016	1018.7	24	103			
	650	GORK	4 S/F	1017	1018.6	10.7	120			
	1415	ATHN	20 GRF	1017.1	1019.3	16.7	89.4	53.6		
	2950	GORK	4 S/F	1017.3	1019.5	11.6	156			
	200	GORK	46 C	1017.4	1018.2	8.2	130			
	200	GORK		1017.4	1021.7		5200			
	100	GORK	46 C	1017.5	1022.3	5.5	606000			
	9500	BERL	4	1017.5	1019.2	31	17			
	9100	GORK	20 GRF	1017.6	1020.1	25.5	21	8		
	127	TORN	47 GB	1017.8	1022.3	8.5	660	160		
	113	POTS	45 C	1017	1402	237	700			
	6100	KISV	45 C	1017	1020	28	14			
	8800	ATHN	20 GRF	1018.7	1020.1	13.6	9.5	5.7		
	3100	GRIM	3 S	1024	1025	2	15	5		
	200	GORK	46 C	1031.4	1042.3	27.6	140			
	200	GORK		1031.4	1043		290			
	200	GORK		1031.4	1049.8		1300			
	127	TORN	25 R	1031 U		250 D	450	170		INCOMPLETE
	408	TRST	49 GB	1033.5	1043.9	13.5	180			
	237	TRST	47 GB	1036	1044.5	238.5D	410			63R
	237	TRST		1036	1049.7		1620			81R
	237	TRST		1036	1051.8		600			85R
	237	TRST		1036	1057.5		650			92R
	1420	ARCE	40 F	1038.9	1039.2	6				
	408	TRST	49 GB	1047	1049.7	12	150			
	9500	BERL	20	1101.5	1102.5	12	6			
	1470	BERL	1 S	1102	1102.3	1.5	3			
	1420	ARCE	1 S	1242.8	1242.9	.5				
	18	HCMA	41 F	1528	1533	5			1	
	2695	PENT	20 GRF	2044	2048	20	1.6	0.8		
	9400	HUAN	1 S	2238	2234.3	4.3	28.2	7.1		L
4	4995	MANI	3 S	0254.5	0255.1	3.5	45.4	27.2		
	8800	MANI	3 S	0254.5	0255	1	26.6	15.7		
	5730	IRKU	45 C	0254	0255.4	9	40			L
	5730	IRKU		0254	0257.2		33			R
	5730	IRKU	49 GB	0304	0305.3	40	31			L
	5730	IRKU		0304	0309.6		41			R
	5730	IRKU		0304	0326		47			R
	5730	IRKU		0304	0327		57			R
	5730	IRKU		0304	0334		27			R
	5730	IRKU		0304	0334.8		25			R
	5730	IRKU	1 S	0355	0357.5	6	9			R

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	208	VORO	45 C	0407.6	0409	3.4	300			
	200	HIRA	46 C	0408	0409	3	700	100		WRWL
	100	HIRA	46 C	0408.2	0409	4	1200	500		WRWL
	5730	IRKU	GB	0633		38	150 D			R
	9100	GORK	2 S/F	0719.2	0720.5	4.5	27	5.8		
	5730	IRKU	1 S	0719	0720.2	3	18			R
	8800	MANI	3 S	0719.4	0720.4	4.1	37.2	11.2		
	6100	KISV	3 S	0720	0723.5	13	9			
	260	ONDR	44 NS	0820 E		323 D	94			
	245	SGHR	44 NS	1218 E	1715	540 D	23.6			
	200	GORK	2 S/F	0826.4	0826.8	1.4	11	5		
	113	POTS	45 C	0828.5	0829.9	5	2000	300		
	3100	GRIM	1 S	0828.5	0830.5	4	7	2		
	100	GORK	46 C	0828.6		4.9	50			
	127	TORN	47 GB	0828.6	0830.4	4.5	600 U			
	200	GORK	46 C	0828.8	0830.7U	6.2	160			
	1420	ARCE	4 S/F	0828.8	0830	2.5				
	1420	ARCE	29 PBI	0831.3		12				
	6100	KISV	1 S	0828	0830	17	5			
	237	TRST	47 GB	0829.1	0830.2	3.7	265			4L
	650	GORK	1 S	0829.2	0830.4	3	4	2		
	2950	GORK	20 GRF	0829.4	0830.6	9.6	16	4.7		
	6100	KISV	1 S	1053	1055	6	2			
	237	TRST	41 F	1112.7	1112.9	.3	53			4R
	930	BORD	41 F	1251.4	1251.7	.6	13	2		
	2695	PENT	20 GRF	2045	2056	45	2	1		
5	3100	GRIM	1 S	0759	0802	6	3	1		
	260	ONDR	44 NS	0827 E		335 D	34			
	245	SGHR	44 NS	1218 E	1527.8	540 D	17.6			
	1470	BERL	1 S	0947.6	0948.2	.9	4			
	930	BORD	8 S	1103.7	1103.7	.1	16	1		
	237	TRST	41 F	1431.2	1431.2	.4	55			21L
	9400	HUAN	20 GRF	1542.7	1556.4	13.7	18	5.4		L'
	2800	OTTA	8 S	1934.2	1934.5	0.8	2.6	1.3		
6	100	HIRA	8 S	0435.4	0436	1	400	80		WL
	200	HIRA	8 S	0435.5	0435.9	.6	600	500		WL
	9100	GORK	1 S	0808.3	0808.5	2.3	12.8	2.8		
	6100	KISV	29 PBI	0808	0830	5	2			
	9100	GORK	1 S	0831	0832.2	5.3	4	2		
	260	ONDR	44 NS	0840 E		320 D	16			
	127	TORN	43 NS	1150 U	1219.1	160 D	12			UNCERTN
	410	SGHR	44 NS	1218 E	1434.5	541 D	44.3			
	245	SGHR	44 NS	1218 E	1943	541 D	32.4			
	2800	OTTA	20 GRF	1650	1735	110	2.6	1.8		
	200	HIRA	44 NS	2150 E	0600	600 D	15	5		SR
	208	VORO	44 NS	2300	0405	360	35	28		
7	100	HIRA	48 C	0017		450 D		350		
	100	HIRA		0017	0200		900			SR
	100	HIRA		0017	0325		700			SR
	100	HIRA		0017	0425		650			SR
	208	VORO	49 GB	0113.5	0152	82.3	145			
	208	VORO		0113.5	0209		160			
	200	HIRA	48 C	0117		220		60		
	200	HIRA		0117	0124		150			MR
	200	HIRA		0117	0145		500			MR
	200	HIRA		0117	0407		130			SR
	500	HIRA	24 R	0120	0129	220	10	3		MR
	500	HIRA	46 C	0138	0130.2	1.2	13	8		MR
	4995	MANI	3 S	0305	0309.7	9	51.9	17.3		
	8800	MANI	3 S	0305	0305.3	5.8	99.2	37.2		NT
	4995	MANI	3 S	0323.8	0327.1	3.2	57.1	34.6		
	2695	MANI	3 S	0323.8	0327.3	3.2	35	22.7		
	8800	MANI	3 S	0323.8	0326.2	2.7	24.8	14.9		
	2930	VORO	2 C	0323	0327	10	22			
	606	MANI	3 S	0330.2	0333.6	4.8	13	4.3		
	500	HIRA	46 C	0332.7	0333.6	2.3	30	12		MR
	1415	MANI	3 S	0333.8	0334.7	1.4	30.8	20		
	500	HIRA	46 C	0355.3	0357.4	5	18	8		MR
	500	HIRA	46 C	0418	0430.4	20	20	5		MR
	500	HIRA	46 C	0614		39		20		
	500	HIRA		0614	0625.4		210			WL
	500	HIRA		0614	0620.7		35			WL
	500	HIRA		0614	0647		60			O
	500	HIRA		0614	0637.5		150			O
	606	MANI	3 S	0625.3	0626	2	65.1	43.4		
	1415	MANI	3 S	0625.3	0625.8	1.7	12.3	7.7		
	4995	MANI	3 S	0625.3	0625.7	2.3	86.5	5.2		
	3100	GRIM	1 S	0631	0631.5	1.5	3	1		
	9100	GORK	47 GB	0632.5E	0646.8U	26	412			
	9100	GORK	29 PBI	0632.5E	0658.7	108	35	15.6		
	3100	GRIM	47 GB	0633	0639	41	450	150		
	606	MANI	4 S/F	0633	0637.5	7.5	86.8	56.4		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	8800	MANI	47 GB	0633.6	0638.3	24.9	2250	1350		
	4995	MANI	47 GB	0633.5	0638.6	23	2200	495		
	1415	MANI	4 S/F	0633.8	0639.2	20.2	215.6	138.6		
	200	HIRA	46 C	0633	0636	20	200	20		WL
	35000	NAGO	49 GB	0634	0639	16 D	950			A
	650	GORK		0638.7E	0638.8	16.1	47			
	100	GORK	27 RF	0639 E	0641 U	13	870 U			
	200	GORK	46 C	0639.6	0646	29.6	120			
	200	GORK		0639.6	0651.2		120			
	200	GORK		0639.6	0657		150			
	2950	GORK		0640.5		32				
	100	GORK	44 NS	0650		190		5		
	650	GORK	20 GRF	0657.7	0702.2	16	4	2		
	1415	MANI	3 S	0730.2	0731.8	1.8	9.2	6.2		
	606	MANI	3 S	0730.5	0731.8	1.9	43.4	21.7		
	127	TORN	26 FAL	0740 E		120 U	15			SUNRISE
	127	TORN	44 NS	0740 E		410 D				V=0
	100	GORK	43 NS	1058		44		20		
	410	SGMR	44 NS	1219 E	1526.7	542 D	18.9			CONT
	245	SGMR	44 NS	1219 E	1526.2	542 D	48.6			CONT
	3100	GRIM	26 FAL	0826	1026 .	120	12			
	536	ONDR	42 SER	0921	1303	222	36			
	930	BORD	41 F	0952.4	0952.6	.2	29	2		
	408	TRST	7 C	0957.9	0958.1	.3	330 D			
	260	ONDR	42 SER	0958	0958	237	27			
	100	GORK	41 F	1024.7	1025.5	4.1	50			
	100	GORK		1024.7	1026.5		55			
	100	GORK		1024.7	1028.2		40			
	408	TRST	7 C	1031.9	1032.1	.3	150 D			
	408	TRST	42 SER	1050.3	1112	46	25			
	3100	GRIM	24 R	1101	1126	25	6			
	6108	KISV	4 S/F	1101	1112.5	19	15			
	237	TRST	41 F	1103.1	1103.3	.3	190			0
	9100	ARCE	21 GRF	1104.3	1229.4	152				
	237	TRST	47 GB	1105.2	1150.3	193.5	255			68R
	237	TRST		1105.2	1219.8		1150			16R
	237	TRST		1105.2	1233.3		2500			14R
	127	TORN	45 C	1105.7	1106.7	2.2	130	10		
	9100	GORK	2 S/F	1106.1	1108	3.2	6.8	3.4		
	1420	ARCE	1 S	1106.7	1106.8	.5				
	930	BORD	41 F	1106	1106.9	1.2	13	2		
	200	GORK	46 C	1110	1129.5	94	150			
	200	GORK		1110	1139		240			
	200	GORK		1110	1143.7		340			
	3100	GRIM	1 S	1110	1125	6	3	1		
	202	IZMI	25 R	1110	1128.5	32.5	110	38		
	9400	HUAN	1 S	1110.5	1116	5.5	31.2	10.9		R
	260	ONDR	49 GB	1110		92	216 D	78		
	113	POTS	45 C	1110	1213	130	100			
	234	POTS	45 C	1110	1233.5	150	1400			
	9100	GORK	2 S/F	1111	1113	3.4	15	3.8		
	3000	BERL	20	1111.5	1201	243	14			
	9500	BERL	2 SF	1111	1113	4	9			
	9100	ARCE	3 S	1112.3	1112.7	1.8				
	127	TORN	27 RF	1123 U	1159	190 D	145	55		
	6108	KISV	45 C	1124	1217	66	214			
	1420	ARCE	21 GRF	1126.6		74				
	9100	GORK	4 S/F	1128.9	1130.8	3	66			
	650	GORK	40 F	1131.2	1134.6	4.3	5			
	1470	BERL	46	1135	1147.5	102	49			
	488	TRST	49 GB	1139.3	1148.6	15.7	220 D			
	100	GORK	46 C	1141	1149	32	2850			
	100	GORK		1141	1159.9		2770			
	9500	BERL	46	1142.5	1217.6	155	580			
	202	IZMI	7 C	1142.5	1144.3	3.7	114	43		
	930	BORD	46 C	1142	1149.3	10	115	25		
	808	ONDR	49 GB	1142	1232.4	57	242	58		
	808	ONDR		1142	1149.5		222			
	808	ONDR		1142	1210		227			
	650	GORK	46 C	1143.3	1144.5	8.3	38			
	650	GORK		1143.3	1146		43			
	650	GORK		1143.3	1149.9		85			
	1420	ARCE	4 S/F	1143.4	1146.6	12				
	9400	HUAN	28 PRE	1143.4	1203.3	19.9	26.3	15.8		R
	9400	HUAN	45 C	1143.4	1159	15.6	123.2	44.3		R
	9100	ARCE	4 S/F	1143.6	1145.9	11				
	536	ONDR	49 GB	1143	1234.5	56	416	93		
	536	ONDR		1143	1228.7		403			
	2950	GORK		1144	1146.3U	15.5	130			
	3100	GRIM	47 GB	1144	1146.5	43	108	33		
	3100	GRIM		1144	1210.5		72	24		
	3100	GRIM		1144	1216.5		125	42		
	3100	GRIM		1144	1221		100	33		
	3100	GRIM	29 PBI	1144	1227		4			
	2650	DWIN	45 C	1144	1217	50	120	50		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	POLARIZATION OR REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
	3000	BERL	4	1144	1147	17	105			
	202	IZMI	7 C	1146.2	1149	4.8	162	64		
	202	IZMI	25 R	1151	1155.2	11	56	35		
	408	TRST	49 GB	1155	1158.9	9	290 D			
	1420	ARCE	48 F	1200.3	1214	36.5				
	3000	BERL	45 C	1201	1217.6	36	127			
	9100	ARCE	46 C/F	1202.3	1217	26				
	9100	ARCE		1202.3	1210.5	9.5				
	9100	ARCE		1211.8	1213.7	4.5				
	9100	ARCE		1216.3	1217	12				
	9400	HUAN	46 C	1203.3	1222.7	19.4	290.6	141		R
	9400	HUAN		1203.3	1216.8		385.9			R
	9400	HUAN	29 PBI	1222.7	1313.5	50.8	106.7	34.2		R
	930	BORD	46 C	1203	1211.4	21	133	30		
	408	TRST	49 GB	1204	1221.2	20	1400 D			
	408	TRST	49 GB	1224	1230.5	16	1900			
	930	BORD	46 C	1226	1232.6	11	146	15		
	4995	BCUL	3 S	1842.5	1844	2.5	17	5		
	2695	BOUL	3 S	1844	1845	2.5	3	1		
	8800	SGMR	47 GB	1857	1929.7	63	761	228		CONT
	1420	BCUL	48 GB	1857	1915	91.5	447	12		
	4995	SGMR	47 GB	1858	1929.9	65	781	204		CONT
	245	SGMR	7 C	1858.4	1928.9	99.2	102.6	30.8		CONT
	410	SGMR	7 C	1858.5	1930.5	89.5	122	36.6		CONT
	2800	OTTA	28 PRE	1858.5	1911.2	24.5	28	12.6		
	2800	OTTA	47 GB	1923	1930	27	620	150		
	2800	OTTA	30 PBI	1950	1950	65	8.6	2.8		
	2800	OTTA	20 GRF	1954	1958	14	8.2	4.1		
	606	SGMR	23 GRF	1858.6	1929.9	87.4	74.2	22.3		CONT
	2695	SGMR	47 GB	1858.8	1929.8	77.2	687	182		CONT
	2695	BCUL	49 GB	1859.5	1931	87	619	33		
	1415	SGMR	46 C	1901.5	1930.2		203			CONT
	1415	SGMR	46 C	1901.5	1915.5	63.5	469	141		CONT
	4995	BOUL	47 GB	1902	1929.5	78	581	55		
	9400	HUAN	28 PRE	1907.1	1924.5	17.4	18.1	8		R
	9400	HUAN	45 C	1924.5	1938.8	14.3	3694.5	1387.5		R
	9400	HUAN	29 PBI	1938.8	2036.8	58	821	384.4		R
	245	SGMR	7 C	1935.6	1955		86.6			CONT
	245	SGMR	7 C	1935.6	1944.4	30.7	123	36.9		CONT
	410	SGMR	7 C	1936.7	1958.2		51.3			CONT
	410	SGMR	7 C	1936.7	1939.6	31.4	261	78.3		CONT
	606	SGMR	46 C	1938.2	2002.1		105.4			CONT
	606	SGMR	46 C	1938.2	1938.9	38.1	195	58.4		CONT
	200	HIRA	44 NS	2150 E	0230	440 D	15	5		SR
	200	VORO	44 NS	2300	0116	360	26	12		
8	2930	VORO	7 C	0000	0003	51	55			
	2930	VORO		0000	0025		83			
	100	HIRA	42 F	0001.5	0002	3	800			WL
	4995	MANI	3 S	0001.7	0003.5	12	72.6	47.8		
	1415	MANI	3 S	0001.8	0003.6	5.8	14.6	9.1		
	8800	MANI	3 S	0001.8	0003.5	6.5	68.7	40.5		
	100	HIRA	7 C	0007	0007	1	1200	350		WL
	606	MANI	3 S	0008.5	0009.7	7.1	21.8	13.6		
	500	HIRA	46 C	0008.8	0009.7	10	20	6		0
	100	HIRA	7 C	0009	0009.5	3.5	430	80		WL
	100	HIRA	46 C	0013	0022	20	100	50		SR
	1415	MANI	3 S	0022.6	0027.2	9.9	36.4	18.2		
	606	MANI	3 S	0022.8	0024.4	6.7	51.7	27.2		
	4995	MANI	3 S	0022.8	0025	9.7	123.9	40		
	500	HIRA	46 C	0022.8	0025.3	20	70	15		0
	8800	MANI	21 GRF	0022.9	0025	10.2	161.9	45		I
	8800	MANI	8 S	0032.2	0032.3	.1	1050	500		
	200	HIRA	46 C	0038	0039	6	25	10		0
	200	HIRA	46 C	0047	0051	7	35	15		0
	606	MANI	3 S	0050.2	0051.8	51.9	252.9	16.3		
	1415	MANI	3 S	0052.8	0052.9	5.6	9.1	3.6		
	500	HIRA	46 C	0102	0111	18	28	5		0
	200	HIRA	46 C	0110.5	0117	16	70	15		0
	500	HIRA	48 C	0150	0213	62	4000	150		WR
	2930	VORO	49 GB	0205	0215	19	403 D			
	2930	VORO	30 PBI	0232	0235	8	35			
	200	VORO	47 GB	0207	0213	24.5	240	40		
	1415	MANI	4 S/F	0208.2	0210.3	12.9	279	175		
	4995	MANI	47 GB	0208.3	0213	12.3	515	343.2		
	8800	MANI	47 GB	0208.3	0212.8	11.8	810	506		IG
	5730	IRKU	49 GB	0208.5	0209 U	50	240 D			R
	5730	IRKU		0208.5	0210 U		240 D			R
	5730	IRKU		0208.5	0212 U		240 D			R
	100	HIRA	42 F	0208.5	0217	12	1000			WL
	606	MANI	47 GB	0208.6	0212.5	11.6	2100	1300		
	200	HIRA	48 C	0209	0213	20	500	40		WR
	35000	NAGO	5 S	0210	0213	13	154			
	35000	NAGO	29 PBI	0223	0237	80	25			
	100	HIRA	27 RF	0221	0226	130	200	40		0

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
	208	VORO	3 S	0244.5	0246.2	6.5	60	30		
	200	HIRA	46 C	0245	0247.5	7	75	25		0
	500	HIRA	46 C	0307.3	0308.1	2.7	28	15		MR
	500	HIRA	46 C	0311.5	0312.1	1	45	10		MR
	500	HIRA	46 C	0318.1	0319.7	2.3	20	7		MR
	6100	KISV	45 C	0703	0714	42	481			
	3100	GRIM	47 GB	0707	0710.5	10	32	11		
	3100	GRIM		0707	0712		60	20		
	3100	GRIM		0707	0714.5		66	22		
	3100	GRIM	29 PBI	0707	0717		18	6		
	8800	MANI	47 GB	0708	0713.8	18.5	986.7	658		
	9100	GORK	46 C	0708	0711	18.8	439			
	9100	GORK		0708	0712.6		1263			
	9100	GORK		0708	0714.6		1441			
	9100	GORK	30 PBI	0708	0726.8	35.2	40	12		
	4995	MANI	3 S	0708	0714.3	18.5	344.8	218		
	100	HIRA	48 C	0708.8	0713	10	1200 D	500		WL
	1415	MANI	3 S	0709	0712.6	10.5	63.6	41.3		
	500	HIRA	46 C	0709.7	0711	5	200	90		0
	686	MANI	3 S	0709.8	0712.2	4.7	114.1	72		
	200	HIRA	46 C	0709	0711.8	10	600	30		WL
	5738	IRKU	49 GB	0709	0710.8	46	105			R
	5730	IRKU		0709	0712		160			R
	5730	IRKU		0709	0715		160 D			L
	5730	IRKU		0709	0716.7		120			L
	5730	IRKU		0709	0717.8		126			L
	127	TORN	45 C	0710.5	0713.4	5	200 D	50 D		SUNRISE
	3100	GRIM	1 S	0718	0719	2	12	4		
	100	HIRA	46 C	0719.5	0720.8	3.5	350	100		WL
	3100	GRIM	1 S	0729	0732	5	14	1		
	9100	GORK	2 S/F	0730	0732.3	4	9.3	6		
	9100	ARCE	20 GRF	0932.6	1049.3	140				
	410	SGMR	44 NS	1218 E	1946.5	544 D	24.7			3,CONT
	245	SGMR	44 NS	1218 E	1719	544 D	73.2			3,CONT
	2800	OTTA	240 R	1710	1713	3	2.8	1.4		
	9400	HUAN	28 PRE	1854.1	1900	5.9	16.6	5.2		R
	9400	HUAN	3 S	1900	1906.7	6.7	76.4	35.7		R
	9400	HUAN	30 PBI	1906.7	1941.7	35	51.5	21.3		R
	2800	OTTA	46F C	1855	1910.1	21	76	30		
	2800	OTTA		1855	1903	12.5	68			
	2800	OTTA		1907.5	1910.1	8.5	76			
	2800	OTTA	30 PBI	1916	1916	80	6.8	2.3		
	2695	BOUL	45 C	1854.5	1911.5	25	64	21		
	4995	BOUL	45 C	1854	1902.5	41	89	30		
	2695	SGMR	46 C	1856.3	1903.1		66.2	26.5		CONT
	2695	SGMR	46 C	1856.3	1918.3		75.6			CONT
	1420	BOUL	45 C	1856	1900	18	26	9		
	410	SGMR	6 S	1857	1929		111.1			CONT
	410	SGMR	6 S	1857	1913.5	37.5	91.4	36.5		CONT
	4995	SGMR	4 S/F	1857.1	1903.1	27.9	83.2	33.3		CONT
	8800	SGMR	4 S/F	1858	1902.8	21.5	63.7	25.5		CONT
	1415	SGMR	4 S/F	1859.2	1908.2	15.8	62	24.8		CONT
	686	SGMR	4 S/F	1900	1912.2	30	238	95.2		CONT
	2800	OTTA	20 GRF	1940	1947	20	2.2	1.1		
	200	HIRA	7 C	2304.3	2304.4	1	500	40		0
9	6100	KISV	21 GRF	0755	0803	20	2			
	3100	GRIM	1 S	0800	0803	5	2	1		
	260	ONDR	45 C	1010	1011.8	4.5	10	4		
	808	ONDR	3 S	1035	1035	.3	48			
	260	ONDR	2 S/F	1110.6	1110.8	1	7	2.8		
	930	BORD	8 S	1111.4	1111.4	.1	11	2		
	808	ONDR	2 S/F	1111	1111	.4	20			
	9100	ARCE	32 ABS	1118.7	1154	66				
	808	ONDR	2 S/F	1201.7	1204.3	4	16	2.5		
	260	ONDR	40 F	1202	1342.5	107	27	5		
	127	TORN	43 NS	1213	1319.9	148 D	20			V=1
	113	POTS	45 C	1218	1232.6	20	4000	800		
	930	BORD	41 F	1219.8	1220.7	1.2	13	2		
	3000	BERL	4	1223	1232	43	82			
	9500	BERL	4	1224.5	1230.7	51	64			
	808	ONDR	27 RF	1224.6	1232.4	15	29	20		
	1420	ARCE	46 C/F	1224.9	1232.5	12				
	1420	ARCE		1224.9	1230.8	7.1				
	1420	ARCE		1232	1232.5	4.9				
	1470	BERL	4	1224	1232.5	16	36			
	930	BORD	46 C	1225	1234.3	12	50	2		
	3100	GRIM	47 GB	1225	1232	27 U	70	23		
	9400	HUAN	28 PRE	1225.6	1229.2	3.6	17	7.3		0
	9400	HUAN	3 S	1229.2	1236.1	6.9	105.2	56.7		0
	9400	HUAN	29 PBI	1236.1	1316.9	40.8	25.4	7.3		0
	536	ONDR	40 F	1225	1242.5	35	17	4.8		
	2650	OWIN	45 C	1225	1233	15	65	35		
	408	TRST	7 C	1226	1226.1	.5	47			
	9100	ARCE	28 PRE	1226	1226.2	2.3				

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK		FLUX DENSITY MEAN		INT	POLARIZATION OR REMARKS
	9100	ARCE	4	S/F	1228.3	1231.2	9.6						
	9100	ARCE	29	PBI	1237.9		63						
	408	TRST	48	C	1227.3	1228.6	6.2	35					
	127	TORN	47	GB	1228.3	1229.4	5.5	440		260			
	127	TORN			1228.3	1230.2		490					
	127	TORN			1228.3	1232.3		770					
10	500	HIRA	46	C	0656.5	0657.2	3.5	15		5			0
	650	GORK	40	F	0657.3	0657.7	3.9	9					
	650	GORK			0657.3	0659.5		6					
	100	GORK	27	RF	0708.7	0726.8	49.8	65					
	260	ONDR	45	C	0938.2	0939.2	2	13		3			
	536	ONDR	4	S/F	0938.3	0939	1.7	17		2.5			
	808	ONDR	4	S/F	0938.3	0938.3	1.3	40					
	260	ONDR	4	S/F	0945	0945.8	1	5		2			
	930	BORD	41	F	1103.8	1104	.5	16		2			
	650	GORK	4	S/F	1125.9	1126.5	1.2	27		11			
	260	ONDR	42	SER	1247	1302.2	39	10					
	237	TRST	5	S	1302.3	1302.3	.1	80		20			0
	536	ONDR	2	S/F	1324.2	1325	1.5	13					
	808	ONDR	2	S/F	1325	1325	.4	32					
	930	BORD	41	F	1432.2	1432.3	.3	43		2			
	208	VORO	42	SER	2319.5	2325	21	145					
	200	HIRA	41	F	2320.5	2325.5	22	600					WLWR
	100	HIRA	46	C	2321	2321	2	980		150			WL
	100	HIRA	46	C	2323.8	2325	8	1200	D	450			WLWR
	100	HIRA	46	C	2334	2336	13	600		80			WL
11	200	HIRA	46	C	0319.5	0321.5	14	7		2			0
	3100	GRIM	20	CRF	0707	0740	68	7		2			
	1420	ARCE	1	S	0829.3	0829.6	1						
	9100	ARCE	20	GRF	0851.4	1029.1	120						
	930	BORD	41	F	1224.8	1224.9	.9	16		2			
	260	ONDR	42	SER	1230	1327.4	80	9					
	2800	OTTA	20	GRF	1740	1815	80	1.4		0.7			
	4995	MANI	3	S	2239.9	2241.7	3.1	33.3		21.2			
	8800	MANI	3	S	2239.9	2241.7	3.1	82.4		47.9			
	2695	MANI	3	S	2240	2241.7	3	16		9.2			
	1415	MANI	3	S	2240.2	2241.7	2.8	3.2		1.6			
12	930	BORD	41	F	0920.8	0921	.4	17		2			
	930	BORD	41	F	0935	0935.1	.3	15		2			
	18	MCMA	6	S	1344	1346	2					1	
	930	BORD	41	F	1437.4	1437.6	.6	13		2			
	2800	OTTA	20	GRF	1500	1538	50	1.4		0.7			
	2800	OTTA	240	R	1927	1930	3	1.2		0.6			
13	208	VORO	42	SER	0141	0143	8	56					
	606	MANI	3	S	0712.9	0713.3	.8	27.5		17.5			
	1415	MANI	3	S	0713.1	0713.3	.4	2.7		1.3			
	3100	GRIM	26	FAL	0717	0831	74	6		2			
	260	ONDR	44	NS	0820	E		341	D	58		1.8	
	245	SGMR	44	NS	1216	E	1426.2	552	D	5.6			
	930	BORD	41	F	0923.8	0924	.3	44		2			
	202	IZMI	41	F	1021	1022.3	6.5	225					
	237	TRST	41	F	1022.2	1022.3	.1	312					10R
	237	TRST	41	F	1026.6	1026.8	.8	223					14R
	930	BORD	41	F	1224.2	1224.3	.8	18		2			
	18	MCMA	6	S	1419	1421	2					2	
	18	MCMA	42	SER	1439	1447	11					2	
	2800	OTTA	27	RF	1755		120	1.4		1.3			
	2800	OTTA	24	R	1755	1805	10	1.4		0.7			
	2800	OTTA	24P	R	1805		100	1.4					
	2800	OTTA	26	FAL	1945	1955	10	-1.4		-0.7			
14	260	ONDR	44	NS	0818	E		360	D	22			
	127	TORN	44	NS	0820	E	1132.3	380	D	45			V=1
	18	MCMA	6	S	1324		1326	2				2	
	18	MCMA	6	S	1348		1349	2				1	
	100	HIRA	44	NS	2150	E	0100	600	D	200		70	SL
	200	HIRA	44	NS	2150	E	0530	600	D	80		40	ML
	208	VORO	44	NS	2300		0245	360		50		25	
15	208	GORK	44	NS	0621	E		339				45	
	100	GORK	44	NS	0621	E		339				30	
	202	IZMI	44	NS	0700			300		42			
	127	TORN	44	NS	0710	E	0802.3	450	D	250			V=2
	260	ONDR	44	NS	0820	E		366	D	74		12	
	410	SGMR	44	NS	1216	E	1559.2	554	D	11.6			
	245	SGMR	44	NS	1216	E	1639.2	554	D	141			
	100	GORK			0621	E							
16	3100	GRIM	20	CRF	0754		0805	45		3		1	
	3100	GRIM	1	S	0828		0828.5	1		3		1	
	1470	BERL	1	S	0856.6		0857.1	1		3			

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	3000	BERL	1 S	0857.6	0958.1	.9	2.5			
	3100	GRIM	26 FAL	0918	1059		2			
	202	IZMI	43 NS	1000		120	60			
	410	SGMR	44 NS	1215 E	1644.1	557 D	8.7			
	245	SGMR	44 NS	1215 E	1416.6	557 D	49			
	127	TORN	43 NS	1227 U	1319.5	140 D	15			V=1
17	606	MANI	3 S	0623.5	0624	1	56.2	35.5		
	1415	MANI	3 S	0623.8	0624	.4	18.7	7.1		
	3100	GRIM	24 R	0712	0926		4			
	245	SGMR	43 NS	1325	1628.9	488 D	28.7			3
	2800	OTTA	20 GRF	1352		130	5.4	2.7		
	113	POTS	45 C	1409.5	1410	1.6	150	40		
	1470	BERL	1 S	1409.7	1410.3	1.3	1.4			
	3000	BERL	1 S	1409.7	1410.4	1.3	4.3			
	2800	OTTA	8 S	1739.9	1740	0.6	1.6	0.8		
18	208	VORO	43 NS	0220		160		7		
	245	SGMR	44 NS	1214 E	1841.2	560 D	106			
	410	SGMR	44 NS	1214 E	1334.7	560 D	18.1			
	8800	ATHN	3 S	1258.5	1303.4	8.3	247.4	130.5		
19	3100	GRIM	1 S	1134	1134	3	3	1		
20	606	MANI	3 S	0605.2	0605.5	1	25.1	15		
	1415	MANI	3 S	0605.4	0605.5	.3	12.7	7.3		
	127	TORN	44 NS	0750 E	1207.2	410 D	11			V=0
	180	GORK	43 NS	0808.3		137		5		
	9100	ARCE	46 C/F	1540.5	1540.9	2.9				AT SUNSET
	9100	ARCE		1540.5	1540.9	1				
	9100	ARCE		1541.5	1542	1.9				
	938	BORD	46 C	1627	1628.4	2	63	2		
21	3100	GRIM	24 R	0718	0742		7			
	3100	GRIM	1 S	0811	0811.5	1	3	1		
	9100	ARCE	1 S	0908.5	0908.6	1				
	9100	ARCE	3 S	1057.9	1058.2	.8				
	9100	ARCE	46 C/F	1103	1105.1	4.4				
	9100	ARCE		1103	1103.4	1.8				
	9100	ARCE		1104.8	1105.1	2.6				
22	2950	GORK	1 S	0640.7	0641.3	2.8	8.3	4		
	9100	ARCE	20 GRF	1149.3	1157.3	92				
	260	ONDR	43 NS	1200		140	16			
	2800	OTTA	20 GRF	1430	1502	130	2.6	1.3		
	2800	OTTA	20 GRF	1645	1802	150	2	1		
	18	HCMA	6 S	2253	2255	3			2	
23	260	ONDR	44 NS	0840 E		318 D	17			
	245	SGMR	44 NS	1210 E	1322.9	570 D	32.5			
	938	BORD	41 F	1105.6	1106	.9	59	2		
	9100	ARCE	1 S	1147.6	1148.5	2				RECORDDISTURBED
	938	BORD	41 F	1242.5	1242.7	.9	30	2		
	938	BORD	8 S	1516	1516	.1	16	2		
	18	HCMA	42 SER	2302	2304	8			2	
24	938	BORD	41 F	0828.5	0830.4	2	26	2		
	938	BORD	8 S	0957.6	0958	.4	46	2		
	536	ONDR	4 S/F	1202.6	1204.2	3	14	1.8		
	938	BORD	41 F	1204	1205.7	2	24	2		
	2800	OTTA	20 GRF	1400	1445	140	3.8	1.9		
	2800	OTTA	21 GRF	1715	1720	30	2.2	1.1		
	2800	OTTA	1 S	1716	1717	2	2	1		
	2800	OTTA	24 R	1845	1915	30	1.2	0.6		
	2800	OTTA	27 RF	1845		105	1.2	0.9		
	2800	OTTA	24P R	1915		55	1.2			
	2800	OTTA	26 FAL	2010	2030	20	-1.2	-0.6		
	2695	PENT	32 ABS	2035	2110	55	-1.2	-0.6		
25	788	SYDN	40 F	0221.7	0223.5	4.6				
	3100	GRIM	20 CRF	0640	0724	60	4	1		
	2695	MANI	3 S	0733	0733.2	.4	2.4	1.4		
	1415	MANI	3 S	0733	0733.2	.4	1.9	1.2		
	4995	MANI	3 S	0733	0733.2	.4	6.3	4.2		
	8800	MANI	3 S	0733.1	0733.2	.2	12	6		
	8800	MANI	3 S	0820	0820.4	.8	12	6		
	2695	MANI	3 S	0820	0820.6	.8	4.8	2.4		
	1415	MANI	3 S	0820	0820.5	.8	3.9	1.9		
	4995	MANI	3 S	0820	0820.4	.8	4.2	2.1		
	1415	MANI	3 S	0855.8	0856.2	.7	1.9	1		
	4995	MANI	3 S	0855.9	0856.2	.6	4.2	2.1		
	8800	MANI	3 S	0855.9	0856.2	.6	6	3		
	938	BORD	8 S	1035.4	1035.6	.2	54	2		
	938	BORD	41 F	1429.2	1429.7	.8	12	2		
	2800	OTTA	240 R	1510	1527	17	2	1		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	2800	OTTA	20 GRF	1538	1558	40	2	1		
	2800	OTTA	21 GRF	1636	1647	25	1.6			
	2800	OTTA	40 F	1644.5	1644.8	3	2.2			
	18	MCMA	42 SER	1842	2023	175			3	
	2800	OTTA	1 S	1945	1946	6	2.2	1		
26	930	BORD	41 F	0954.6	0954.6	.2	13	2		
	1420	ARCE	22 GRF	1124.2	1133.7	43				
	9100	ARCE	22 GRF	1131.6	1133.8	29				RECORDDISTURBED
	127	TORN	7 C	1258	1259.5	3.5	10	2		
	127	TORN		1258	1300.7		14			
	930	BORD	8 S	1342.8	1343	.2	26	2		
	2800	OTTA	20 GRF	1600	1612	40	1.8	0.9		
	930	BORD	41 F	1621.6	1621.8	.3	21	2		
	2800	OTTA	20 GRF	1700	1800	130	1.8	1.2		
	2800	OTTA	240 R	1955	2030	35	1.8	0.9		
	1400	SYDN	4 S	2310	2311.7	5				
	2695	PENT	1 S	2311.5	2313	2.3	4	2		
	1420	BOUL	45 C	2311	2311.5	2	11	4		
	700	SYDN	2 S	2312	2312.7	1.3				
	2695	BOUL	45 C	2312.5	2314	3.5	7	2		
27	5730	IRKU	3 S	0330.3	0331.3	5	40			R
	2695	MANI	20 GRF	0330.6	0331.5	2.2	26.4	17.6		
	1414	MANI	20 GRF	0330.8	0331.8	2.2	11.5	7.6		
	4995	MANI	20 GRF	0330.8	0331.3	2	63	42		
	8800	MANI	20 GRF	0330.8	0331	1.4	66	44		
	1400	SYDN	20 GRF	0331.2	0332	2.5				
	700	SYDN	2 S	0331.5	0331.7	.7				
	260	ONDR	44 NS	0817 E		353 D	12			
	237	TRST	41 F	0828.9	0829.7	.9	125			
	127	TORN	40 F	0832 U	0837.1	15 U	23			
	9100	ARCE	1 S	0927.1	0927.3	1				
	9100	ARCE	21 GRF	1024.4	1102.9	98				
	260	ONDR	45 C	1101.6	1101.6	1.5	34	16		
	9100	ARCE	1 S	1106.9	1107	1				
	9100	ARCE	1 S	1119.1	1119.3	1				
	9100	ARCE	3 S	1308.7	1308.8	.7				
	2800	OTTA	1 S	1328	1329.5	3	4.6	1.6		
	1420	ARCE	23 GRF	1352.3	1440.1	69				
	9100	ARCE	22 GRF	1354.3	1423.5	73				
	1420	ARCE	3 S	1431.6	1432.1	.8				
	2800	OTTA	20 GRF	1550	1605	45	3	1.4		
	245	SGMR	43 NS	1703	1711	282 D	48.6			
	2695	BOUL	23 GRF	2045.5	2046.5	12.5	3	1		
28	208	VORO	43 NS	0100		240		8		
	260	ONDR	44 NS	0800 E		360 D	94			
	245	SGMR	44 NS	1206 E	1917.2	581 D	41.6			
	3100	GRIM	1 S	0809	0810	7	4	1		
	6100	KISV	4 S/F	0838	0840	5	5			
	237	TRST	41 F	1304.7	1304.8	.2	250			
	2800	OTTA	21 GRF	1420	1442	70	3.6	1.8		
	2800	OTTA	4 S/F	1507.2	1508	1.5	21	5.2		
	2800	OTTA	3 S	1522	1523	1	16.6	4.2		
	2800	OTTA	22 GRF	1610	1705	80	2.2	1.1		
	2800	OTTA	20 GRF	1940	2000	40	2.6			
	208	VORO	44 NS	2300		360		7		
29	208	VORO	48 C	0346	0347	2	330 D			
	202	IZMI	41 F	0736.8	0744.8	8.2	350			
	9100	ARCE	24 R	0817		100				
	202	IZMI	41 F	0830	0833.2	4	433			
	237	TRST	42 SER	0830.2E	0830.5	5.6	1300			
	260	ONDR	44 NS	0836 E		312 D	67			
	245	SGMR	44 NS	1205 E	1346.2	583 D	102			
	237	TRST	41 F	0957.8	0957.8	.1	95			
	237	TRST	42 SER	1234.6	1236.2	1.7	210			
	2800	OTTA	23 GRF	1624	1642	60	2			
	2300	OTTA	1 S	1630.1	1630.9	1	1.4	0.7		
	2695	BOUL	8 S	1630.5	1631	1	4	1		
	2800	OTTA	8 S	1715.5	1715.7	0.5	1.4	1		
	2800	OTTA	20 GRF	2100	2102	33	3.4	1.7		
	2695	PENT	20 GRF	2140	2220	75	2.8	1.4		
30	3100	GRIM	20 CRF	0735	0803	65	7	2		
	9100	ARCE	24 R	0819.5		44				
	1420	ARCE	25 R	1047.8		174				
	1420	ARCE	1 S	1109.3	1109.4	.5				
	1420	ARCE	1 S	1112.6	1112.8	.6				
	1420	ARCE	22 GRF	1120.9	1142	60				
	9100	ARCE	28 PRE	1133.2	1134.3	2.8				
	9100	ARCE	47 GB	1136	1139.7	7.8				
	9100	ARCE		1136	1137.3	1.8				
	9100	ARCE		1137.8	1138.4	1.5				

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	9100	ARCE		1139.3	1139.7	4.5				
	9100	ARCE	40 F	1153.2	1153.5	2.5				
	9100	ARCE	32 ABS	1205.6	1223.5	28				
	930	BORD	41 F	1219.6	1220	.4	55	2		
	9100	ARCE	20 GRF	1237	1256.8	91				
	408	TRST	49 GB	1249.2	1249.4	.5	470			
	2800	OTTA	1 S	1741	1742	2	0.8	0.4		
	2695	PENT	240 R	2102	2155	53	2.8	1.4		
	1420	ARCE	3 S		1302.7	5				
31	260	ONDR	42 SER	0925	0939.6	67	222 D			
	237	TRST	42 SER	0936.5	0937.2	6.5	200			5R
	237	TRST		0936.5	0942.7		320			5R
	237	TRST	42 SER	1022.9	1026.7	6.9	510			5R
	930	BORD	41 F	1100.2	1104	.2	19	2		
	260	ONDR	3 S	1159.2	1159.2	.2	13			
	9100	ARCE	25 R	1207.6		34				
	1470	BERL	1 S	1231.3	1232	.1	2.3			
	3000	BERL	4	1231.3	1232.3	7.7	6			
	808	ONDR	8 S	1231.7	1231.7	.3	75			
	1420	ARCE	1 S	1231.8	1232.1	.6				
	9100	ARCE	1 S	1232	1232.4	.6				
	3100	GRIM	1 S	1236	1236.5	1	4	1		
	9100	ARCE	20 GRF	1309.6	1329.2	120				
	2800	OTTA	1 S	1344	1345.2	4	3.6	1.8		
	2800	OTTA	27 RF	1357		73	2	1.8		
	2800	OTTA	24 R	1357	1403	6	2	1		
	2800	OTTA	24P R	1403		62	2			
	2800	OTTA	26 FAL	1505	1510	5	-2	-1		
	4995	BOUL	1 S	1634.5	1637.5	4.5	10	3		
	2695	BOUL	45 C	1635.5	1637.5	6.5	9	3		
	2800	OTTA	2 S/F	1635	1637.8	9	3	1.2		
	2800	OTTA	1A S	1635	1637.8	9	3	1.2		
	2800	OTTA	240 R	1750	1840	50	2.8	1.6		

Reports received from the following observatories:

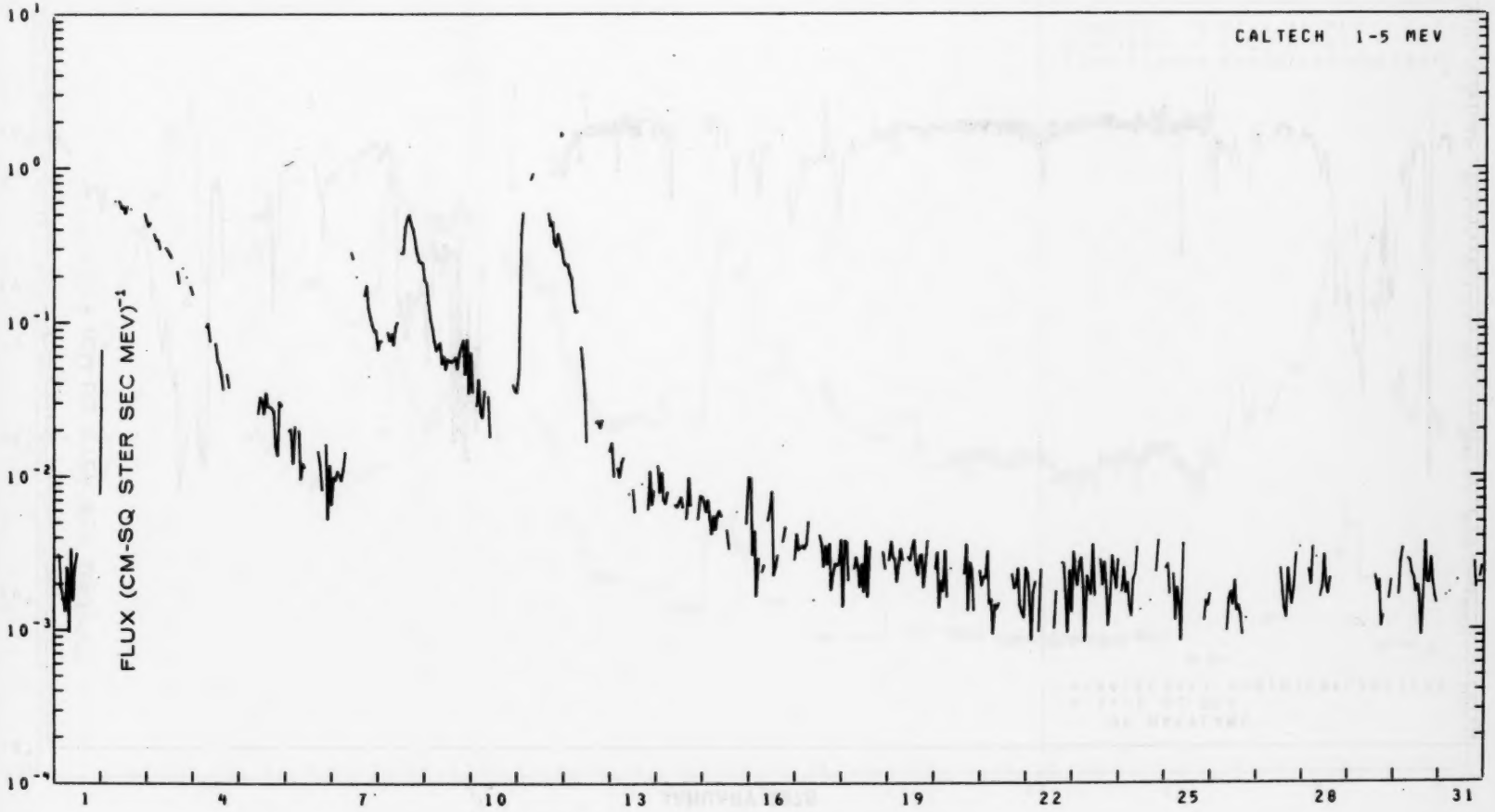
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
NAGO = Nagoya
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam
SAOP = Sao Paulo
SGMR = Sagamore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
TRST = Trieste
VORO = Voroshilov (Ussurisk)

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

IMP 7 AND 8 ELECTRONS

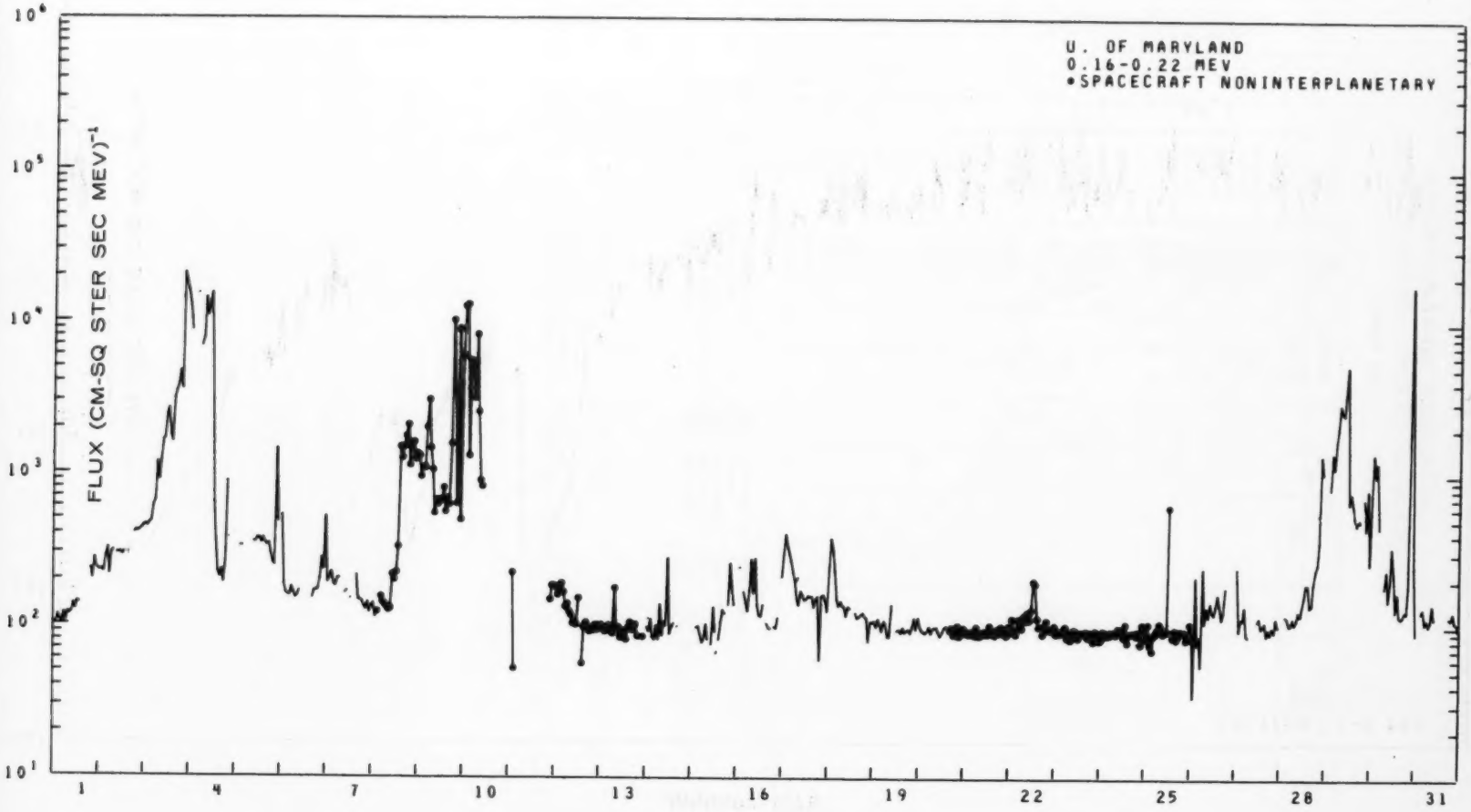
JANUARY 1978



33
Jan 78

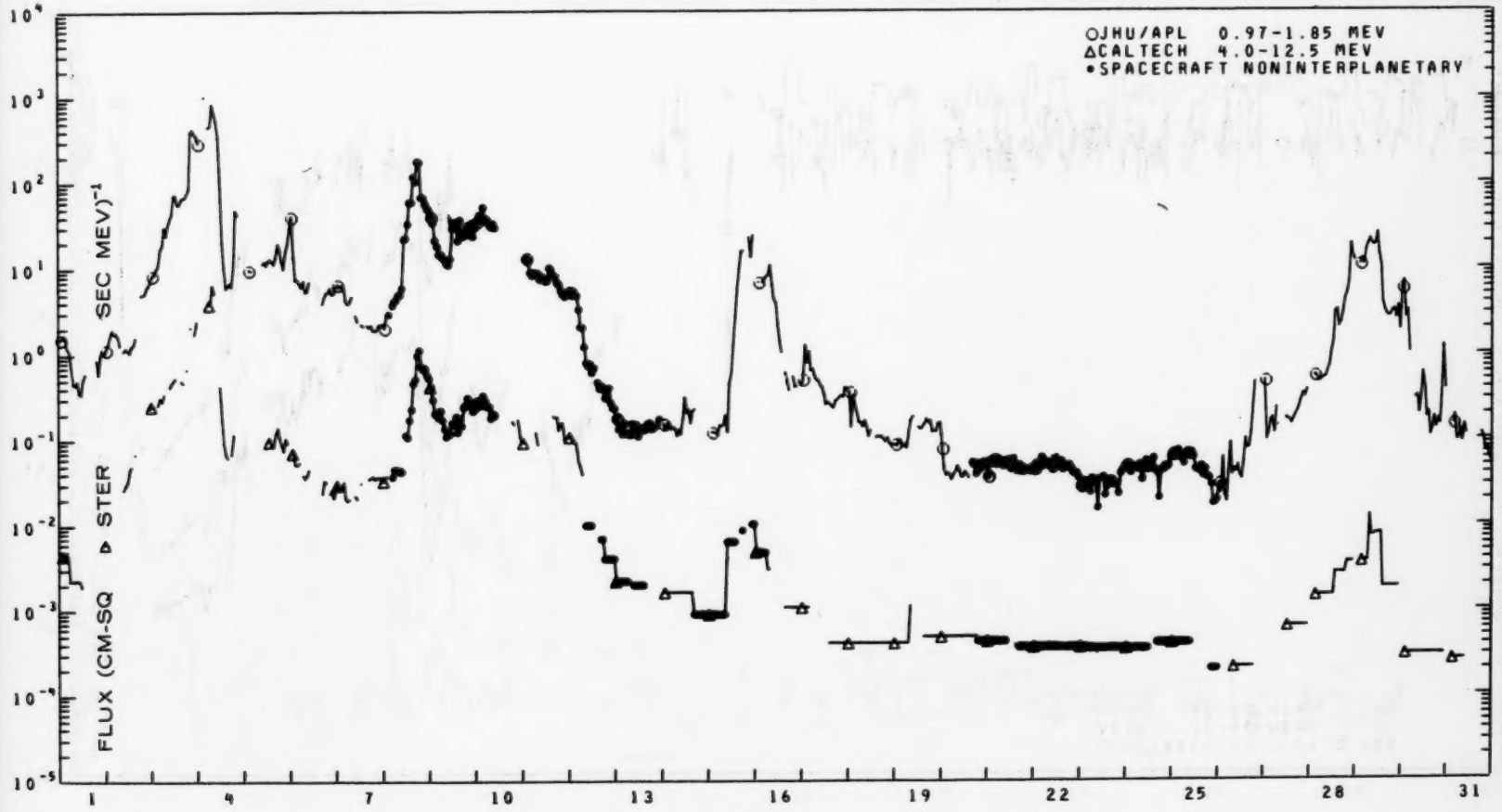
IMP 7 AND 8 LOW ENERGY PROTONS

JANUARY 1978



IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

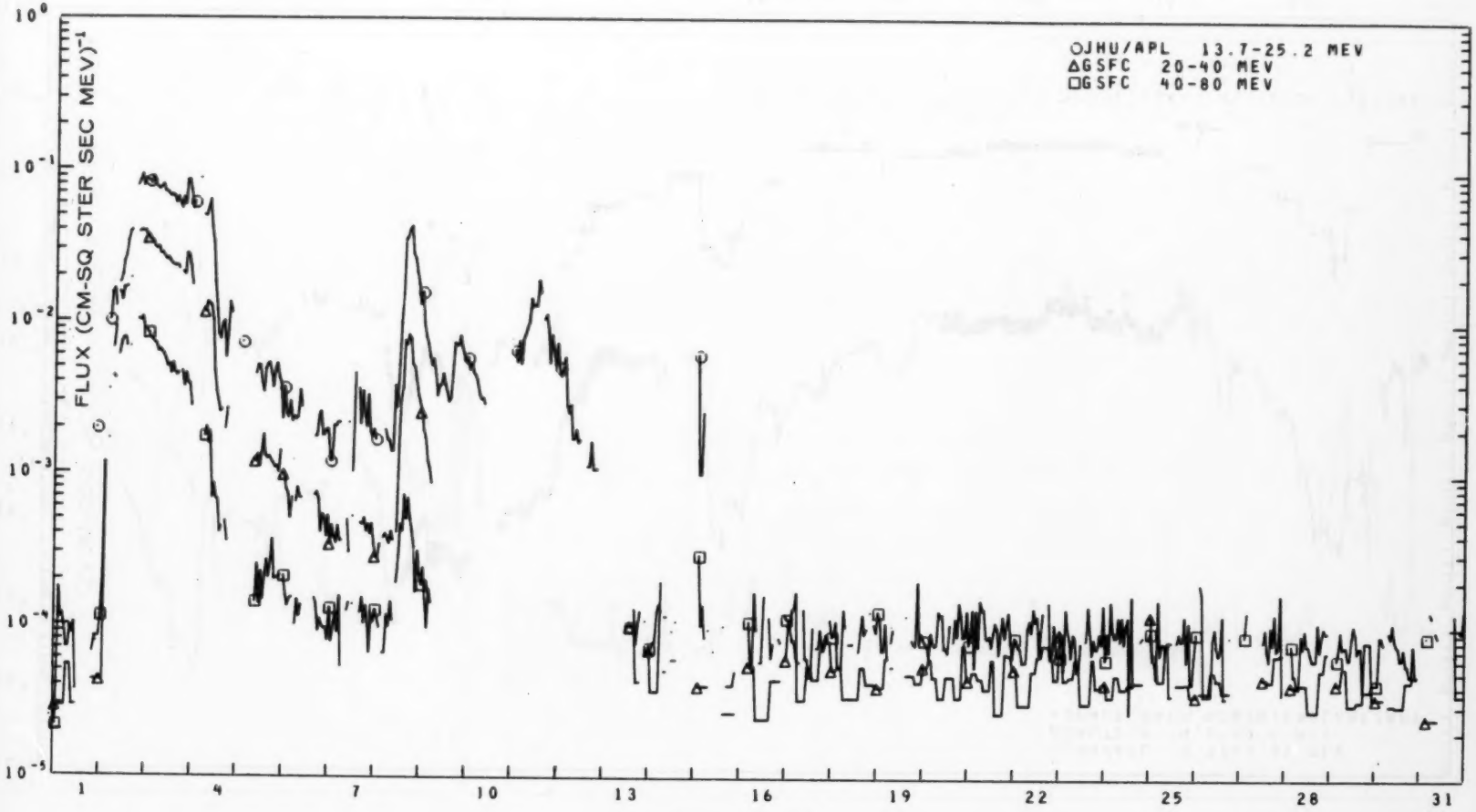
JANUARY 1978



35
Jan 78

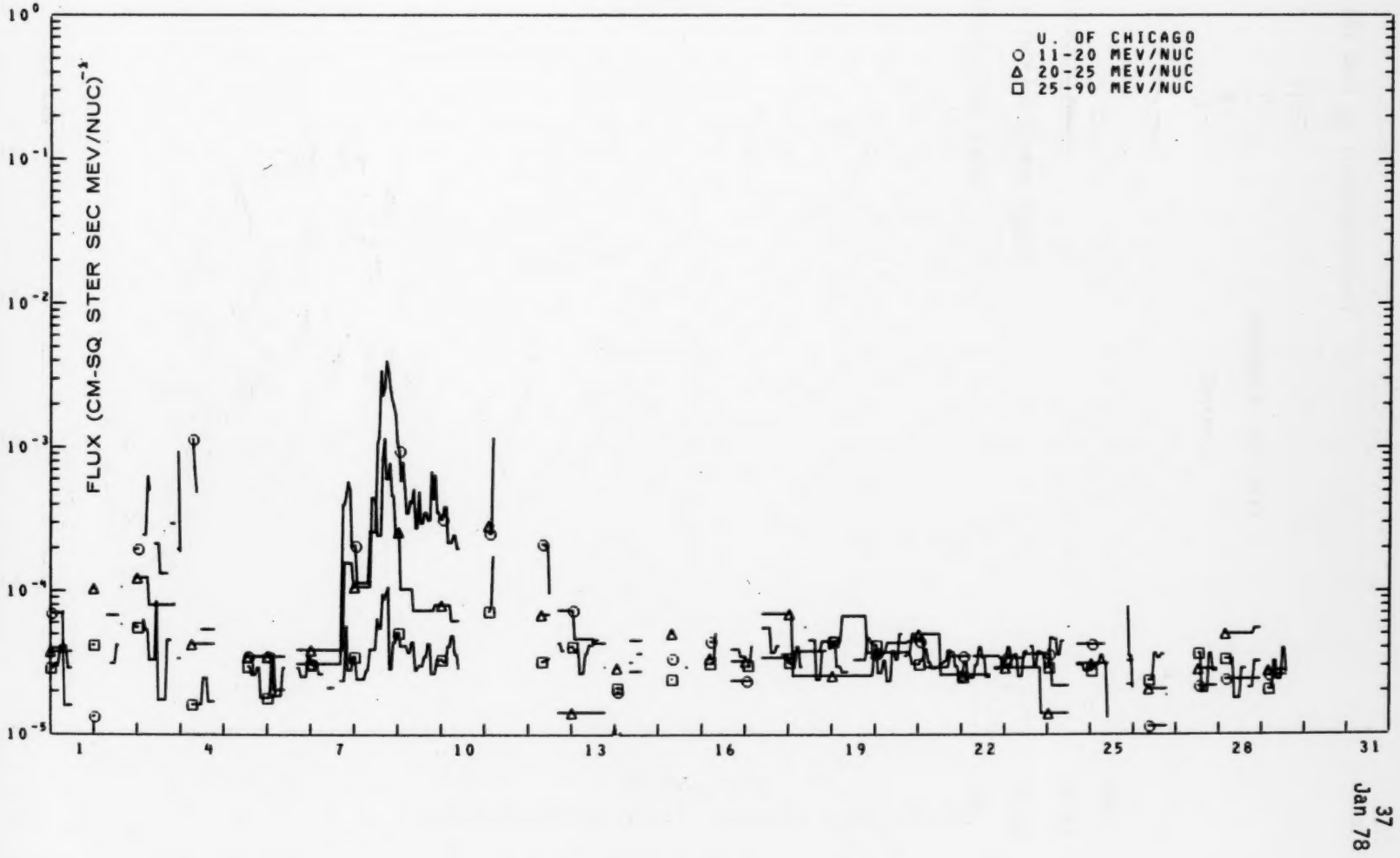
IMP 7 AND 8 HIGH ENERGY PROTONS

JANUARY 1978



IMP 7 AND 8 ALPHA PARTICLES

JANUARY 1978



DECEMBER 1977 DATA

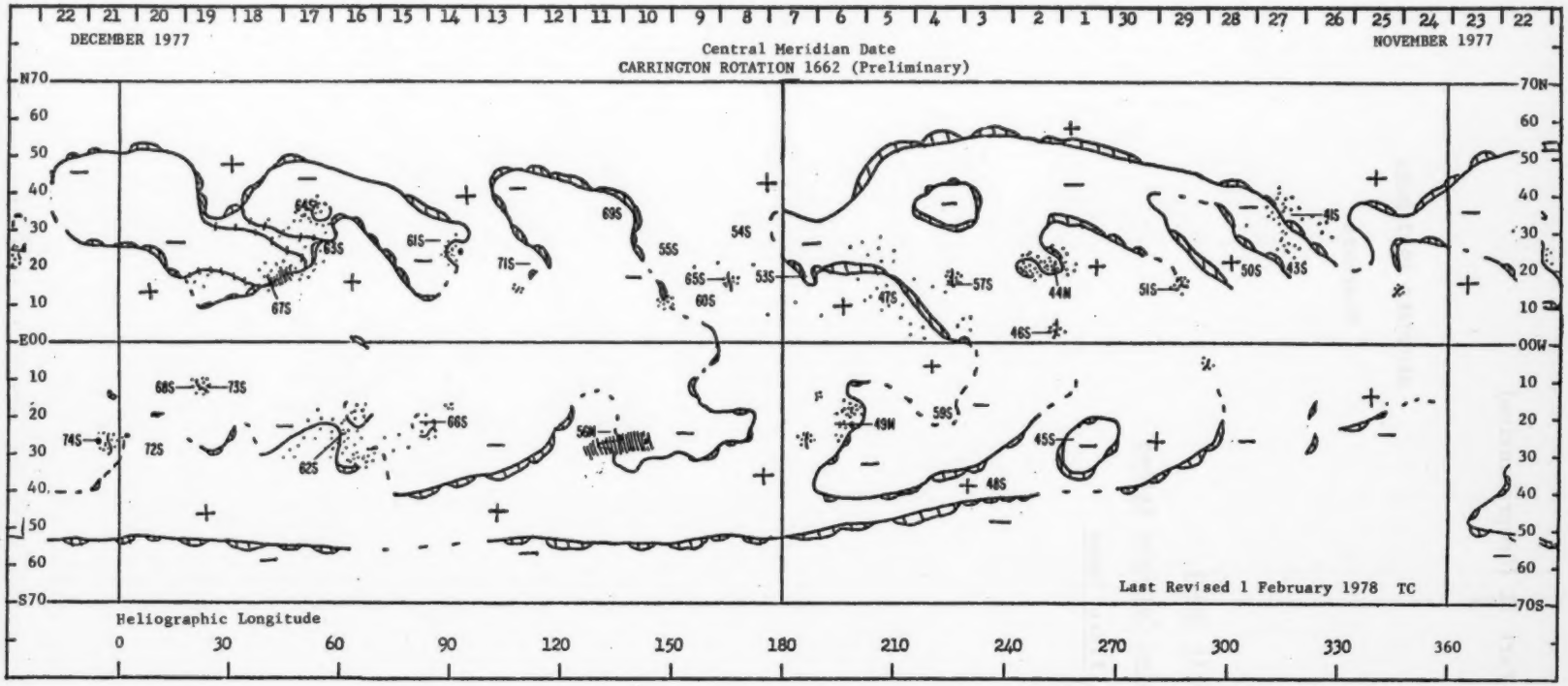
Contents

	Page
Hα Synoptic Chart	40-41
Abbreviated Calendar Record	42-49
Regional Flare Index	49

ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

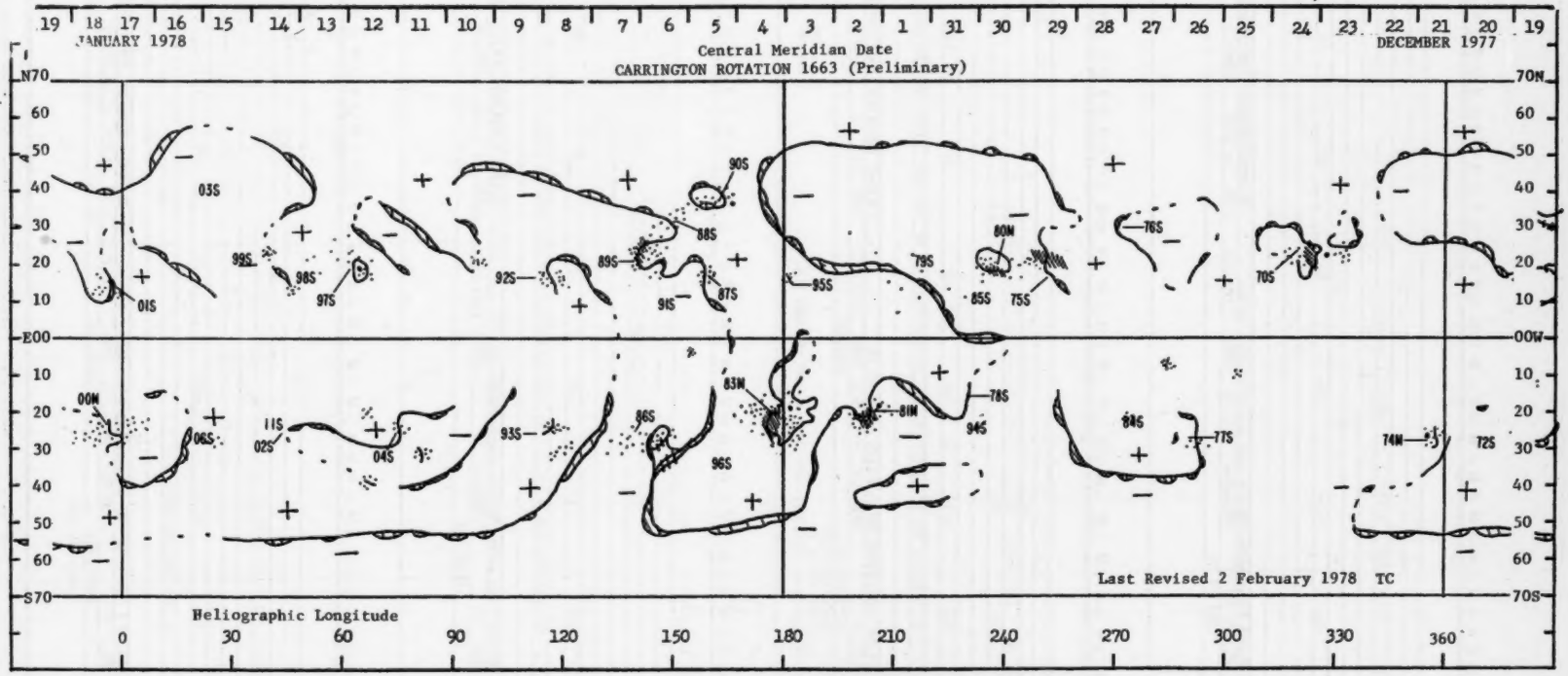
NOVEMBER - DECEMBER 1977

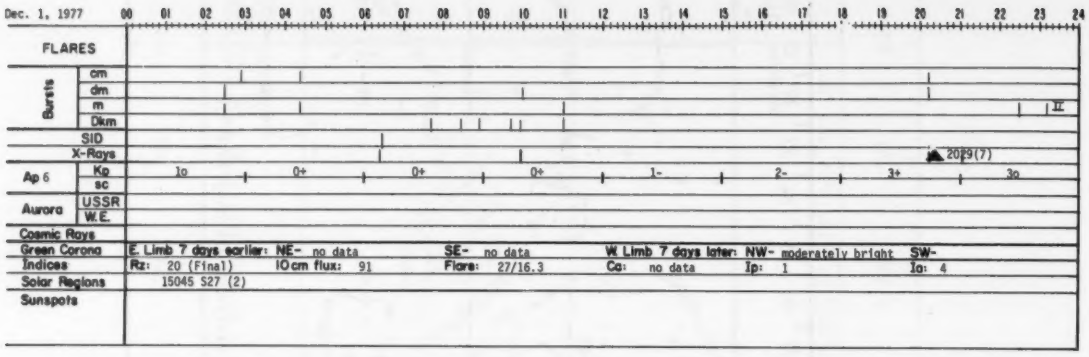


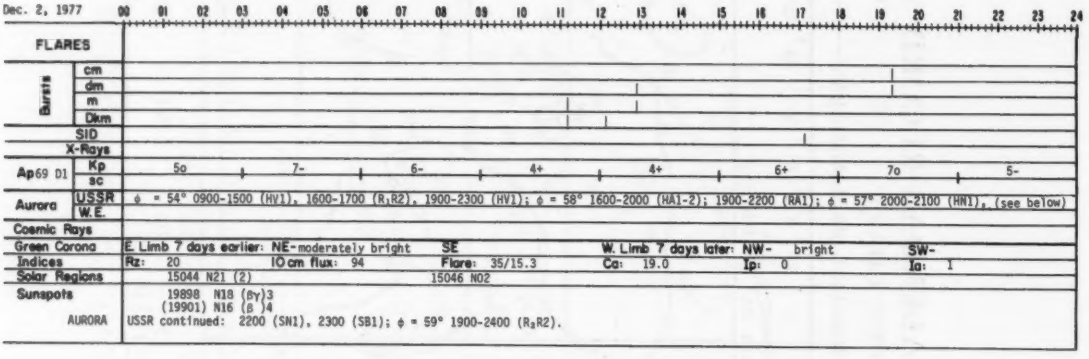
ABBREVIATED CALENDAR RECORD

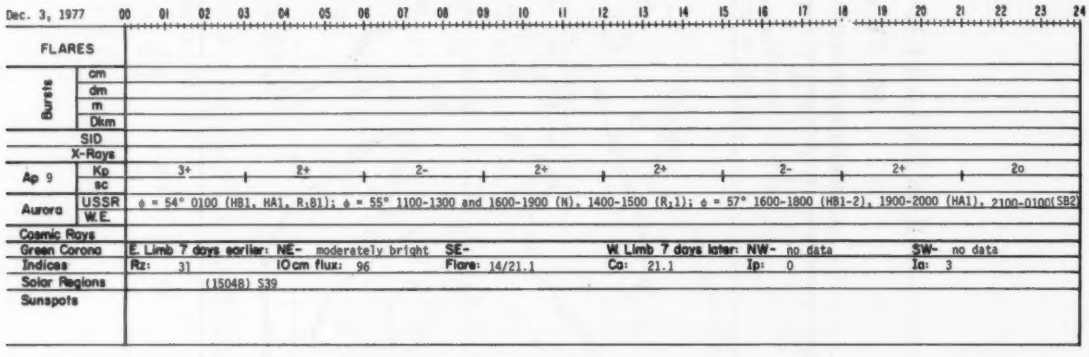
Hα SYNOPTIC CHART

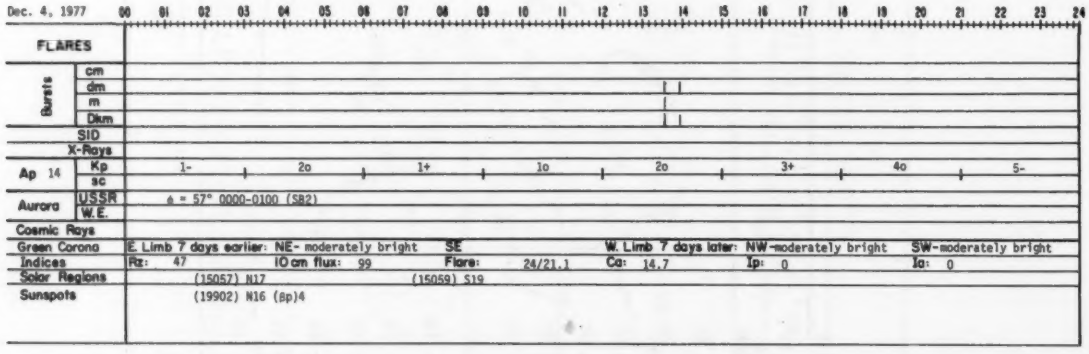
CARRINGTON ROTATION 1663 (PRELIMINARY)

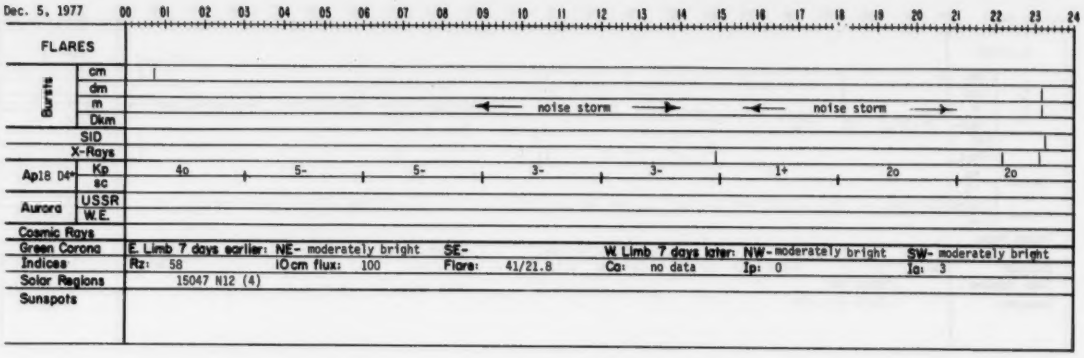


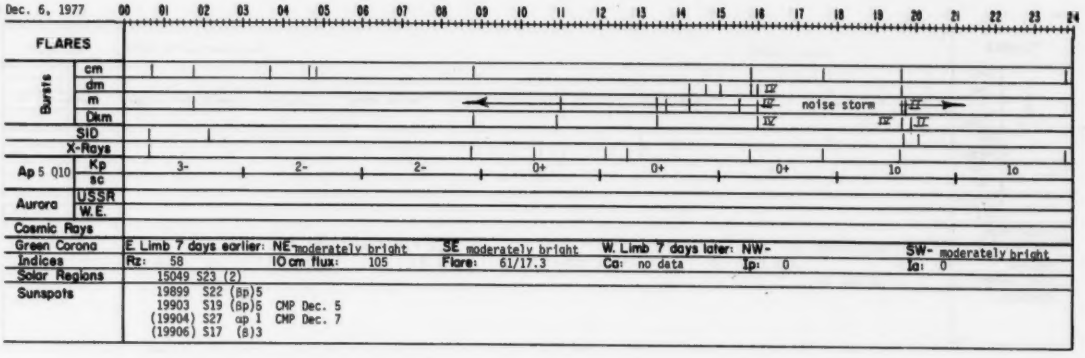

Dec. 1, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
2029(7)
Ap 6
Kp
sc
1o 0+ 0+ 0+ 1- 2- 3+ 3o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- moderately bright SW-
Indices
Rz: 20 (Final) 10cm flux: 91 Flare: 27/16.3 Ca: no data Ip: 1 Ia: 4
Solar Regions
15045 S27 (2)
Sunspots

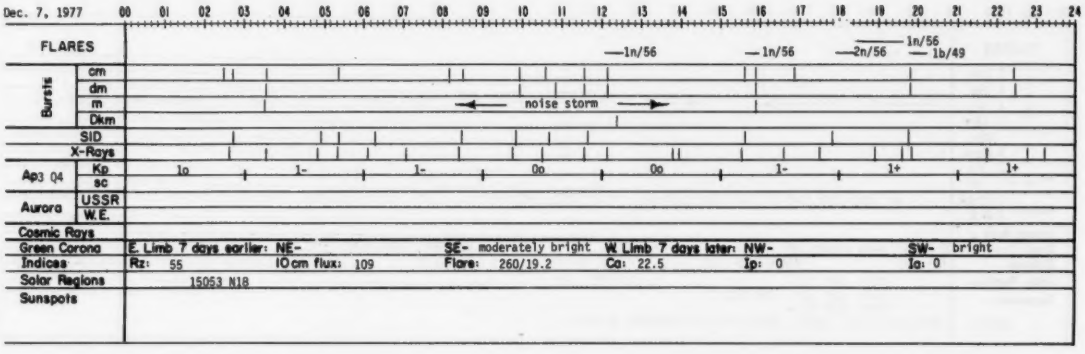

Dec. 2, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 69 D1
Kp
sc
5o 7- 6- 4+ 4+ 6+ 7o 5-
Aurora
USSR
W.E.
φ = 54° 0900-1500 (HV1), 1600-1700 (R1R2), 1900-2300 (HV1); φ = 58° 1600-2000 (HA1-2); 1900-2200 (RA1); φ = 57° 2000-2100 (HN1), (see below)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- bright SW-
Indices
Rz: 20 10cm flux: 94 Flare: 35/15.3 Ca: 19.0 Ip: 0 Ia: 1
Solar Regions
15044 N21 (2) 15046 N02
Sunspots
19898 N18 (βγ)3
(19901) N16 (β)4
AURORA
USSR continued: 2200 (SN1), 2300 (SB1); φ = 59° 1900-2400 (R2R2).

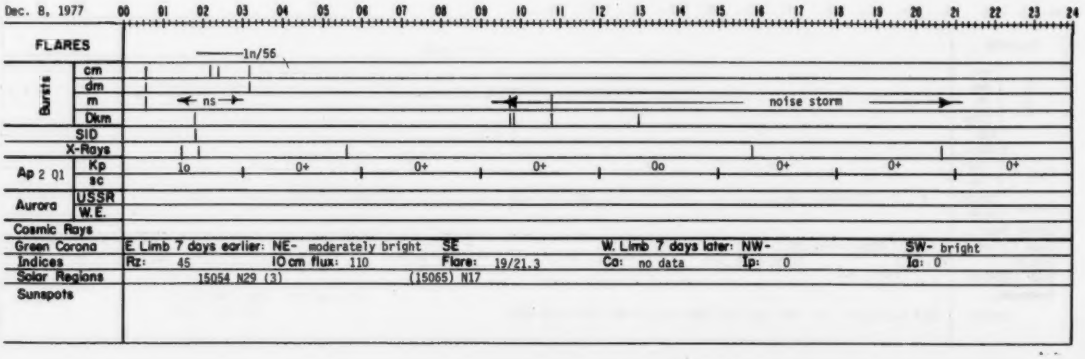

Dec. 3, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 9
Kp
sc
3+ 2+ 2- 2+ 2+ 2- 2+ 2o
Aurora
USSR
W.E.
φ = 54° 0100 (HB1, HA1, R1B1); φ = 55° 1100-1300 and 1600-1900 (N), 1400-1500 (R1); φ = 57° 1600-1800 (HB1-2), 1900-2000 (HA1), 2100-0100(SB2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE- W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 31 10cm flux: 96 Flare: 14/21.1 Ca: 21.1 Ip: 0 Ia: 3
Solar Regions
(15048) S39
Sunspots

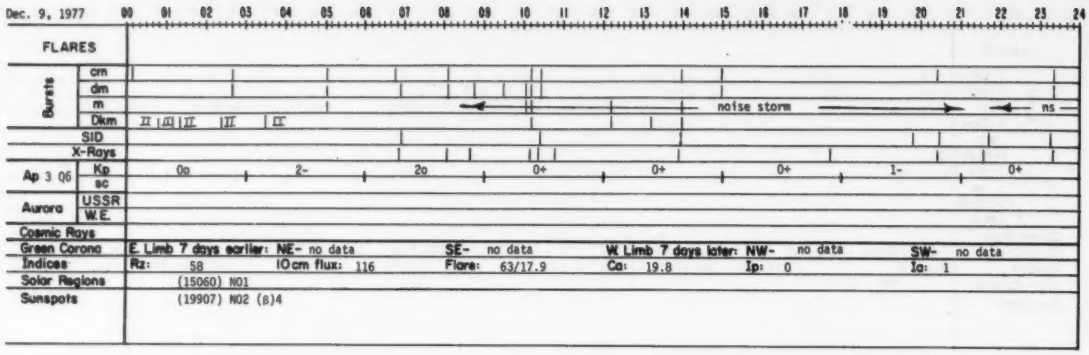

Dec. 4, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 14
Kp
sc
1- 2o 1+ 1o 2o 3+ 4o 5-
Aurora
USSR
W.E.
φ = 57° 0000-0100 (SB2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW-moderately bright SW-moderately bright
Indices
Rz: 47 10cm flux: 99 Flare: 24/21.1 Ca: 14.7 Ip: 0 Ia: 0
Solar Regions
(15057) N17 (15059) S19
Sunspots
(19902) N16 (βp)4

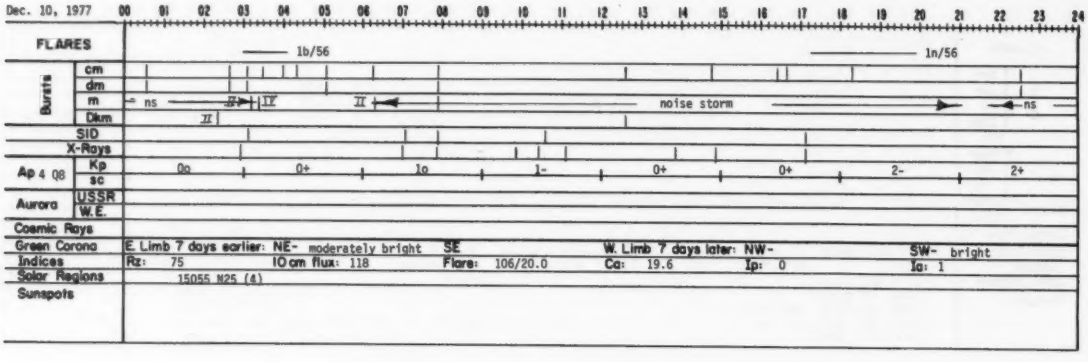

Dec. 5, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
noise storm
SID
X-Rays
Ap18 D4*
Kp
sc
4o 5- 5- 3- 3- 1+ 2o 2o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE-
W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 58 10cm flux: 100 Flare: 41/21.8 Ca: no data Ip: 0 Ia: 3
Solar Regions
15047 N12 (4)
Sunspots

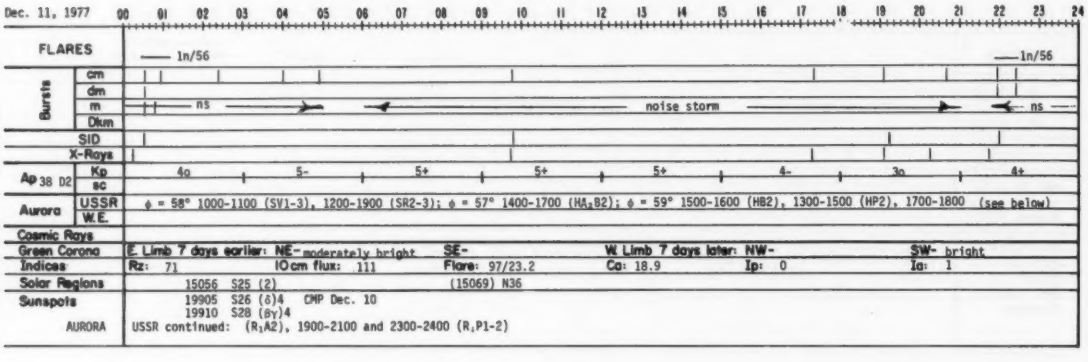

Dec. 6, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 5 Q10
Kp
sc
3- 2- 2- 0+ 0+ 0+ 1o 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE moderately bright
W. Limb 7 days later: NW- SW- moderately bright
Indices
Rz: 58 10cm flux: 105 Flare: 61/17.3 Ca: no data Ip: 0 Ia: 0
Solar Regions
15049 S23 (2)
Sunspots
19899 S22 (βp)5
19903 S19 (βp)5 CMP Dec. 5
(19904) S27 αp 1 CMP Dec. 7
(19906) S17 (β)3

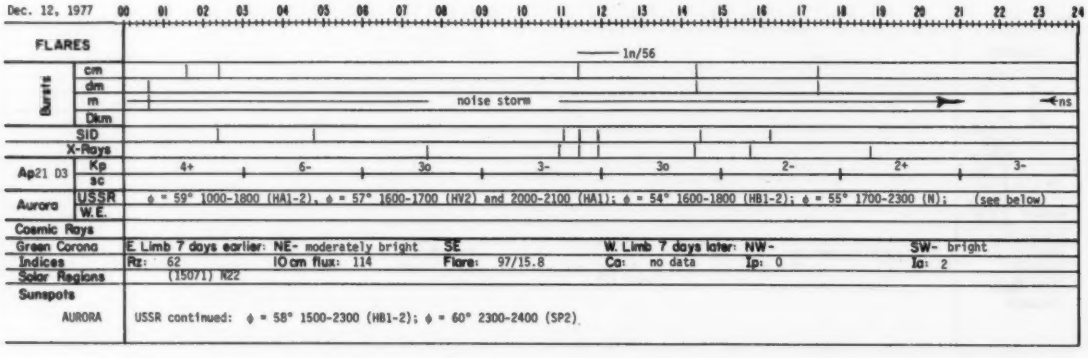

Dec. 7, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/56
1n/56
2n/56
1n/56
1b/49
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap3 Q4
Kp
sc
1o 1- 1- 0o 0o 1- 1+ 1+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE- moderately bright
W. Limb 7 days later: NW-
SW- bright
Indices
Rz: 55 10cm flux: 109 Flare: 260/19.2 Ca: 22.5 Ip: 0 Ia: 0
Solar Regions
15053 N18
Sunspots

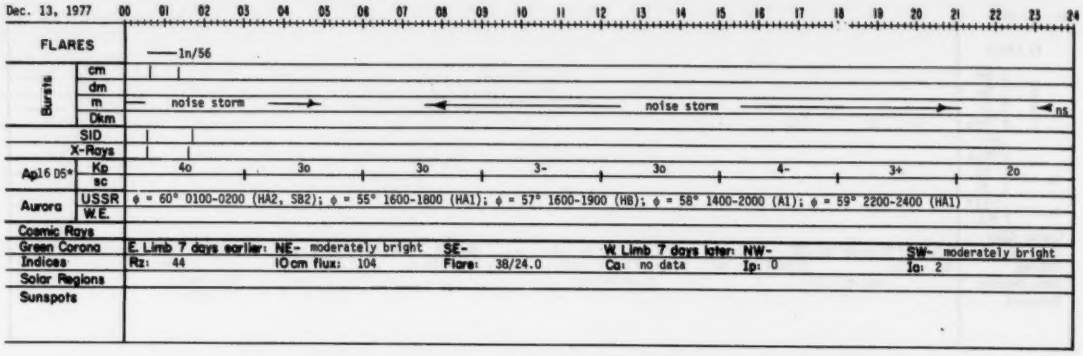

Dec. 8, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/56
Bursts
cm
dm
m
Dkm
ns
noise storm
SID
X-Rays
Ap 2 Q1
Kp
sc
1o 0+ 0+ 0+ 0o 0+ 0+ 0+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW-
SW- bright
Indices
Rz: 45 10cm flux: 110 Flare: 19/21.3 Ca: no data Ip: 0 Ia: 0
Solar Regions
15054 N29 (3)
(15065) N17
Sunspots

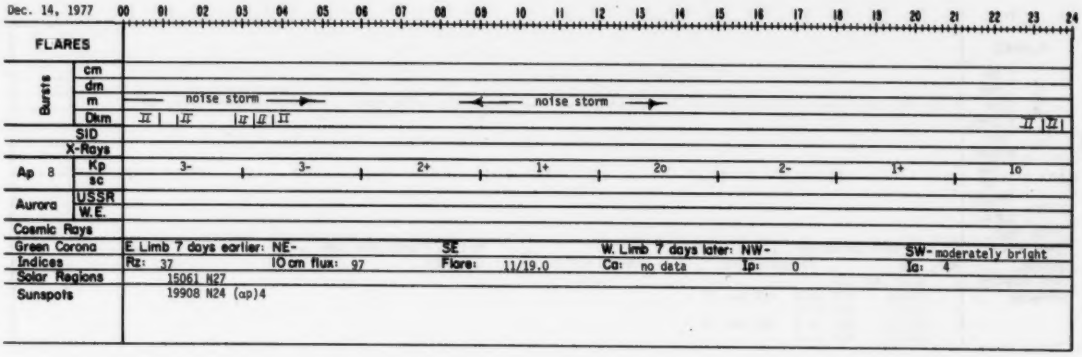

Dec. 9, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
ns
SID
X-Rays
Ap 3 Q6
Kp
sc
0o 2- 2o 0+ 0+ 0+ 1- 0+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E Limb 7 days earlier: NE- no data SE- no data
W Limb 7 days later: NW- no data SW- no data
Indices
Rz: 58 10cm flux: 116 Flare: 63/17.9 Ca: 19.8 Ip: 0 Ia: 1
Solar Regions
(15060) NO1
Sunspots
(19907) NO2 (B)4

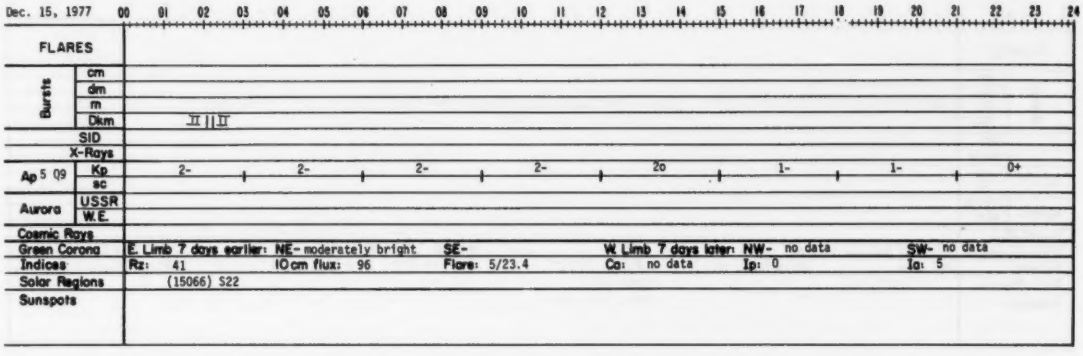

Dec. 10, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1b/56
1n/56
Bursts
cm
dm
m
Dkm
ns
noise storm
ns
SID
X-Rays
Ap 4 Q8
Kp
sc
0o 0+ 1o 1- 0+ 0+ 2- 2+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E Limb 7 days earlier: NE- moderately bright SE
W Limb 7 days later: NW- SW- bright
Indices
Rz: 75 10cm flux: 118 Flare: 106/20.0 Ca: 19.6 Ip: 0 Ia: 1
Solar Regions
15055 N25 (A)
Sunspots

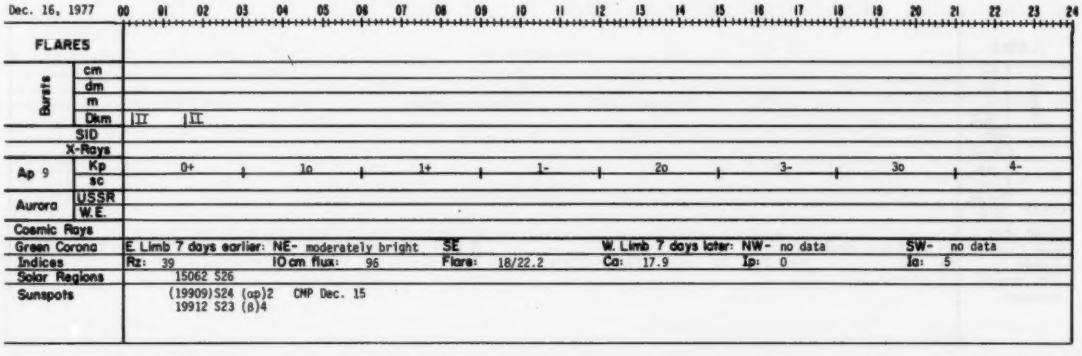

Dec. 11, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/56
1n/56
Bursts
cm
dm
m
Dkm
ns
noise storm
ns
SID
X-Rays
Ap 38 D2
Kp
sc
4o 5- 5+ 5+ 5+ 4- 3o 4+
Aurora
USSR
W.E.
φ = 58° 1000-1100 (SV1-3), 1200-1900 (SR2-3); φ = 57° 1400-1700 (HA,B2); φ = 59° 1500-1600 (HB2), 1300-1500 (HP2), 1700-1800 (see below)
Cosmic Rays
Green Corona
E Limb 7 days earlier: NE- moderately bright SE-
W Limb 7 days later: NW- SW- bright
Indices
Rz: 71 10cm flux: 111 Flare: 97/23.2 Ca: 18.9 Ip: 0 Ia: 1
Solar Regions
15056 S25 (Z) (15069) N36
Sunspots
19905 S26 (δ)4 CMP Dec. 10
19910 S28 (Bγ)4
AURORA
USSR continued: (R,A2), 1900-2100 and 2300-2400 (R,P1-2)

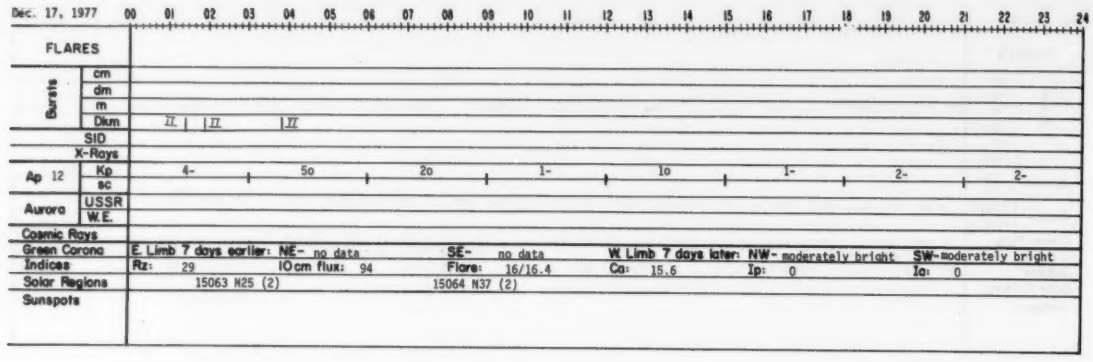

Dec. 12, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/56
Bursts
cm
dm
m
Dkm
noise storm
ns
SID
X-Rays
Ap21 D3
Kp
sc
4+ 6- 3o 3- 3o 2- 2+ 3-
Aurora
USSR
W.E.
φ = 59° 1000-1800 (HA1-2), φ = 57° 1600-1700 (HV2) and 2000-2100 (HA1); φ = 54° 1600-1800 (HB1-2); φ = 55° 1700-2300 (N); (see below)
Cosmic Rays
Green Corona
E Limb 7 days earlier: NE- moderately bright SE
W Limb 7 days later: NW- SW- bright
Indices
Rz: 62 10cm flux: 114 Flare: 97/15.8 Ca: no data Ip: 0 Ia: 2
Solar Regions
(15071) N22
Sunspots
AURORA
USSR continued: φ = 58° 1500-2300 (HB1-2); φ = 60° 2300-2400 (SP2)

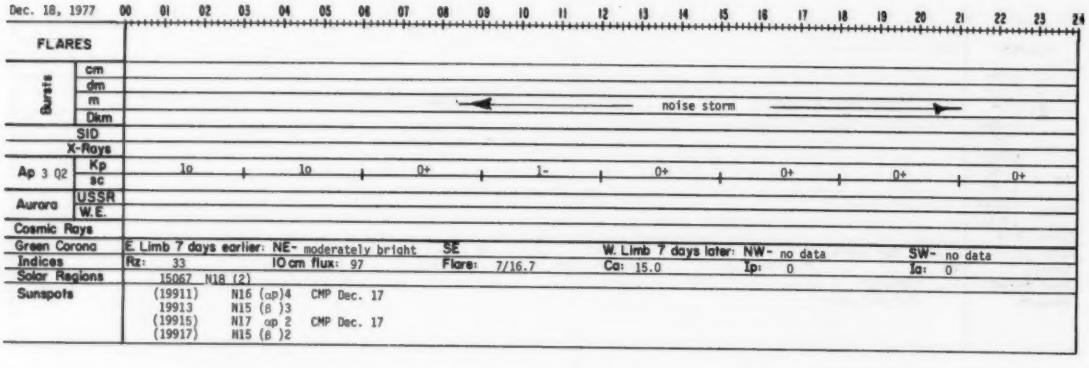

Dec. 13, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/56
Bursts
cm
dm
m
noise storm
noise storm
ns
Dkm
SID
X-Rays
Ap16 05*
Kp
4o
3o
3o
3-
3o
4-
3+
2o
sc
Aurora
USSR
W.E.
ϕ = 60° 0100-0200 (HA2, SB2); ϕ = 55° 1600-1800 (HA1); ϕ = 57° 1600-1900 (HB); ϕ = 58° 1400-2000 (A1); ϕ = 59° 2200-2400 (HA1)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright
SE-
W. Limb 7 days later: NW-
SW- moderately bright
Indices
Rz: 44
10cm flux: 104
Flare: 38/24.0
Ca: no data
Ip: 0
Ia: 2
Solar Regions
Sunspots

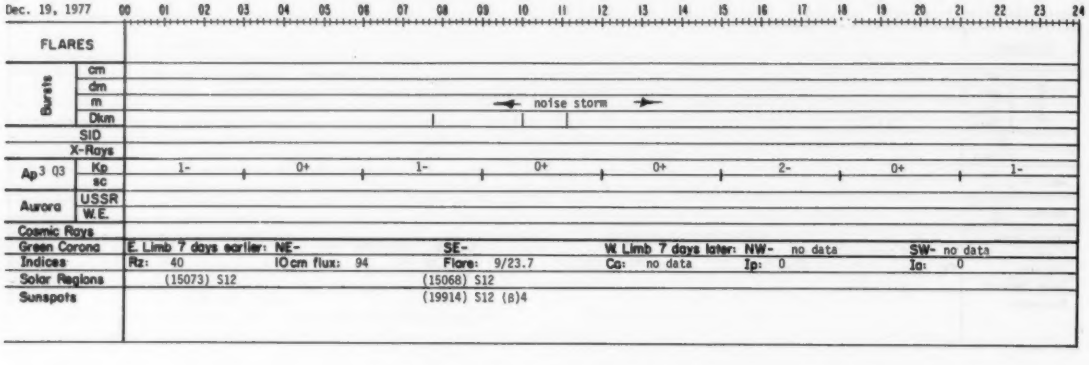

Dec. 14, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
noise storm
Dkm
SID
X-Rays
Ap 8
Kp
3-
3-
2+
1+
2o
2-
1+
1o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE
W. Limb 7 days later: NW-
SW- moderately bright
Indices
Rz: 37
10cm flux: 97
Flare: 11/19.0
Ca: no data
Ip: 0
Ia: 4
Solar Regions
15061 N27
Sunspots
19908 N24 (ap)4

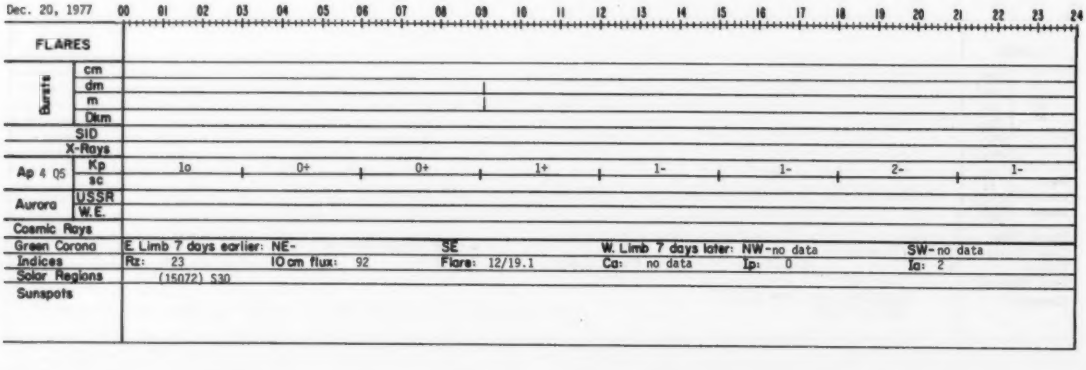

Dec. 15, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 5 09
Kp
2-
2-
2-
2-
2o
1-
1-
0+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright
SE-
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 41
10cm flux: 96
Flare: 5/23.4
Ca: no data
Ip: 0
Ia: 5
Solar Regions
(15066) S22
Sunspots

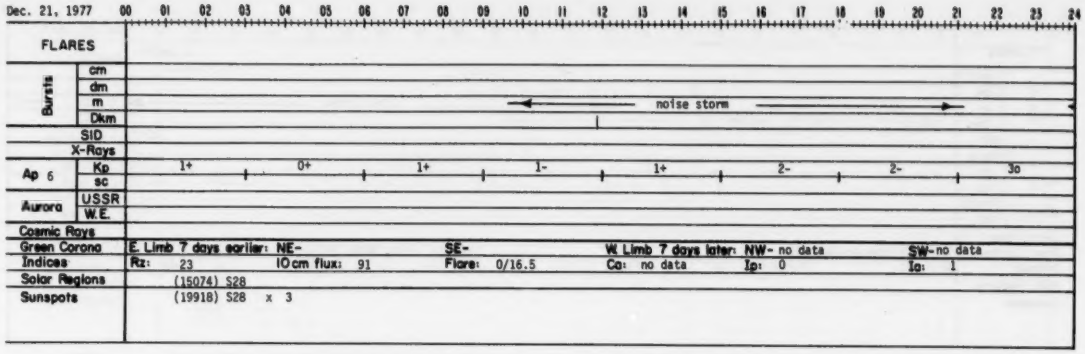

Dec. 16, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 9
Kp
0+
1o
1+
1-
2o
3-
3o
4-
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright
SE
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 39
10cm flux: 96
Flare: 18/22.2
Ca: 17.9
Ip: 0
Ia: 5
Solar Regions
15062 S26
Sunspots
(19909)S24 (ap)2 CMP Dec. 15
19912 S23 (B)4

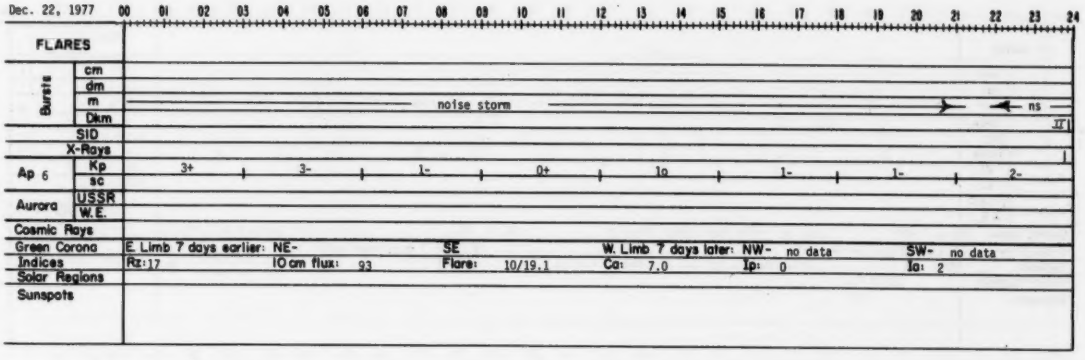

Dec. 17, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 12
Kp
sc
4- 5o 2o 1- 1o 1- 2- 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data
W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 29 10cm flux: 94 Flare: 16/16.4 Ca: 15.6 Ip: 0 Ia: 0
Solar Regions
15063 N25 (2) 15064 N37 (2)
Sunspots

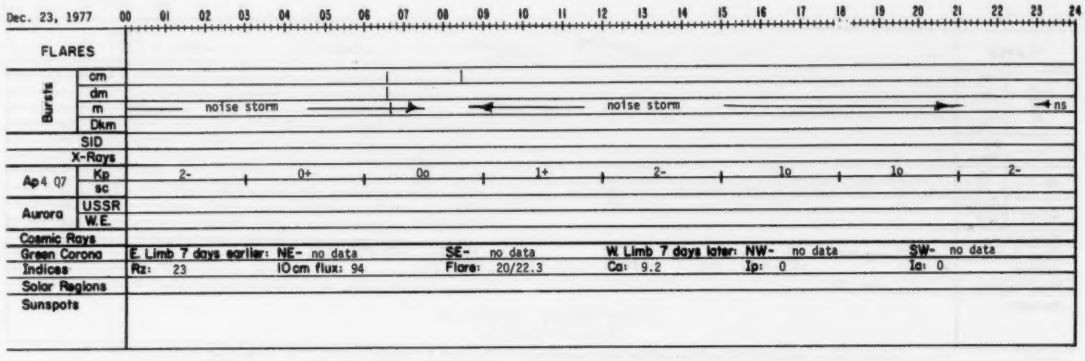

Dec. 18, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 3 Q2
Kp
sc
1o 1o 0+ 1- 0+ 0+ 0+ 0+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 33 10cm flux: 97 Flare: 7/16.7 Ca: 15.0 Ip: 0 Ia: 0
Solar Regions
15067 N18 (2)
Sunspots
(19911) N16 (αp)4 CMP Dec. 17
19913 N15 (β)3
(19915) N17 αp 2 CMP Dec. 17
(19917) N15 (β)2

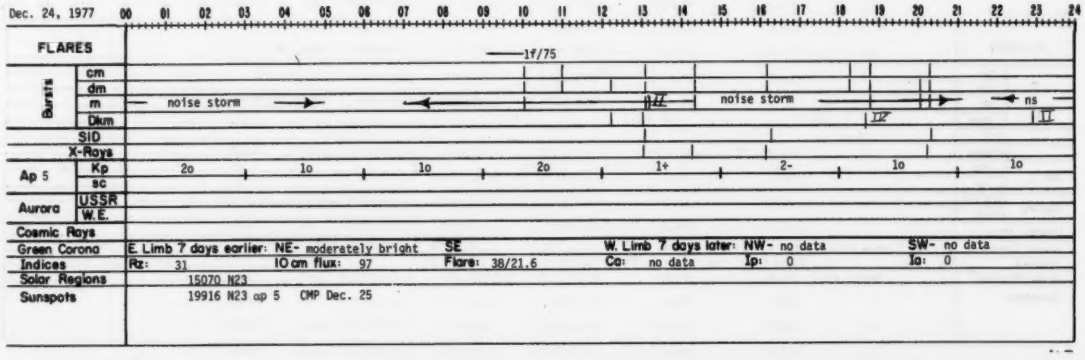

Dec. 19, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 3 Q3
Kp
sc
1- 0+ 1- 0+ 0+ 2- 0+ 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE-
W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 40 10cm flux: 94 Flare: 9/23.7 Ca: no data Ip: 0 Ia: 0
Solar Regions
(15073) S12 (15068) S12
Sunspots
(19914) S12 (β)4

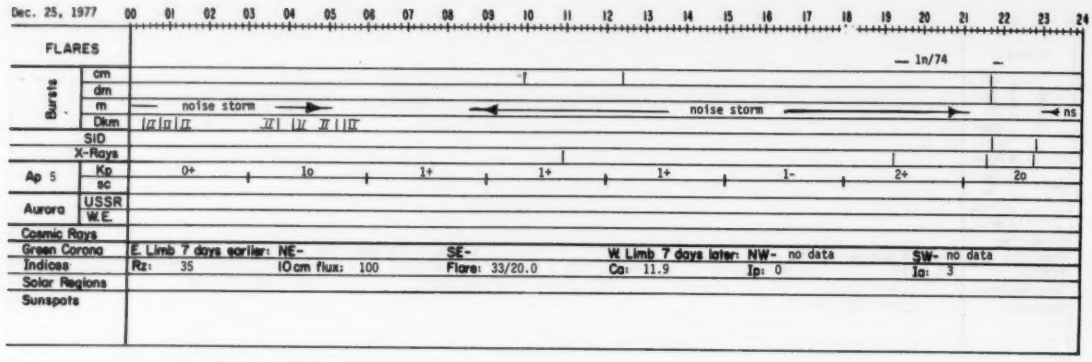

Dec. 20, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 4 Q5
Kp
sc
1o 0+ 0+ 1+ 1- 1- 2- 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE
W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 23 10cm flux: 92 Flare: 12/19.1 Ca: no data Ip: 0 Ia: 2
Solar Regions
(15072) S30
Sunspots

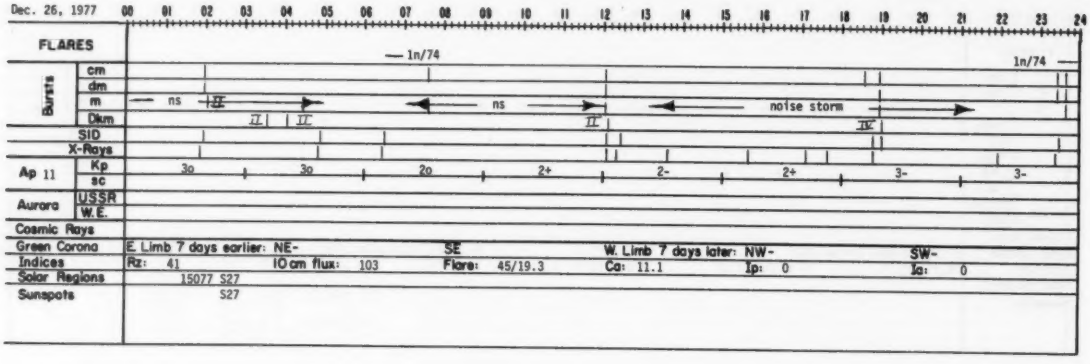

Dec. 21, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 6
Kp
sc
1+ 0+ 1+ 1- 1+ 2- 2- 3o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 23 10cm flux: 91 Flare: 0/16.5 Ca: no data Ip: 0 Ia: 1
Solar Regions
(15074) S28
Sunspots
(19918) S28 x 3

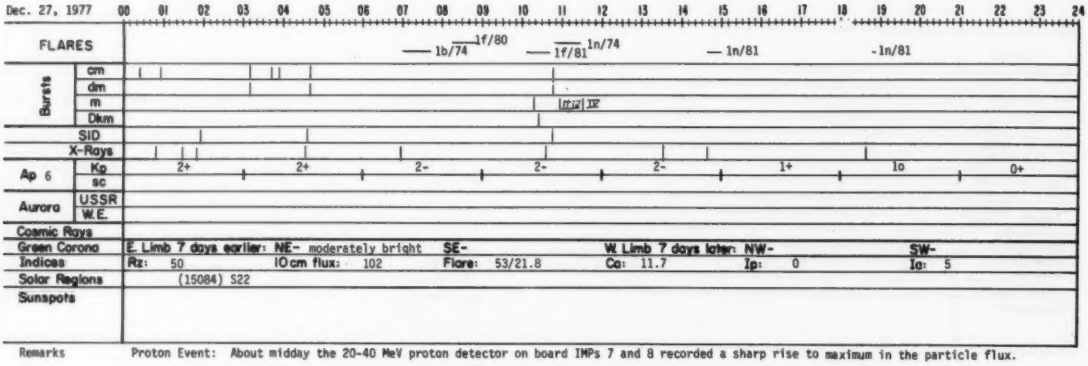

Dec. 22, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
ns
SID
X-Rays
Ap 6
Kp
sc
3+ 3- 1- 0+ 1o 1- 1- 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 17 10cm flux: 93 Flare: 10/19.1 Ca: 7.0 Ip: 0 Ia: 2
Solar Regions
Sunspots


Dec. 23, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
noise storm
ns
SID
X-Rays
Ap4 Q7
Kp
sc
2- 0+ 0o 1+ 2- 1o 1o 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 23 10cm flux: 94 Flare: 20/22.3 Ca: 9.2 Ip: 0 Ia: 0
Solar Regions
Sunspots

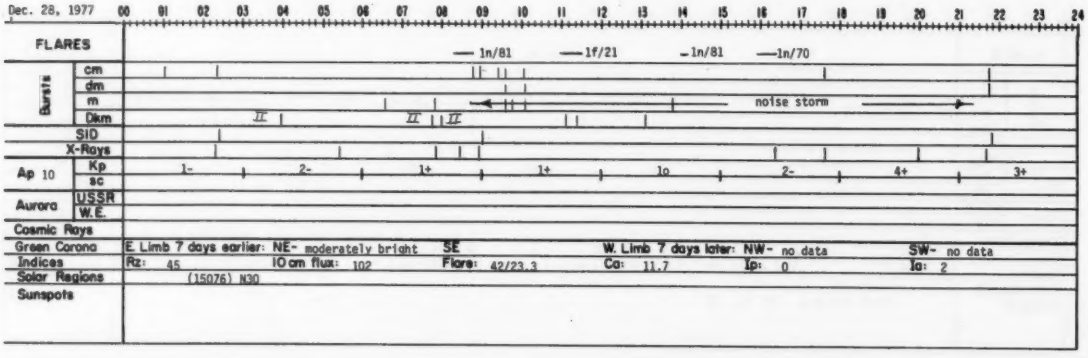

Dec. 24, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1f/75
Bursts
cm
dm
m
Dkm
noise storm
noise storm
ns
SID
X-Rays
Ap 5
Kp
sc
2o 1o 1o 2o 1+ 2- 1o 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 31 10cm flux: 97 Flare: 38/21.6 Ca: no data Ip: 0 Ia: 0
Solar Regions
15070 N23
Sunspots
19916 N23 ap 5 CMP Dec. 25

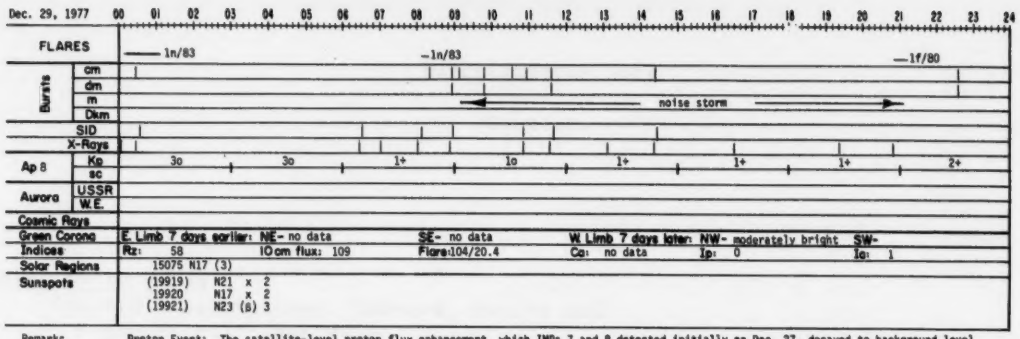




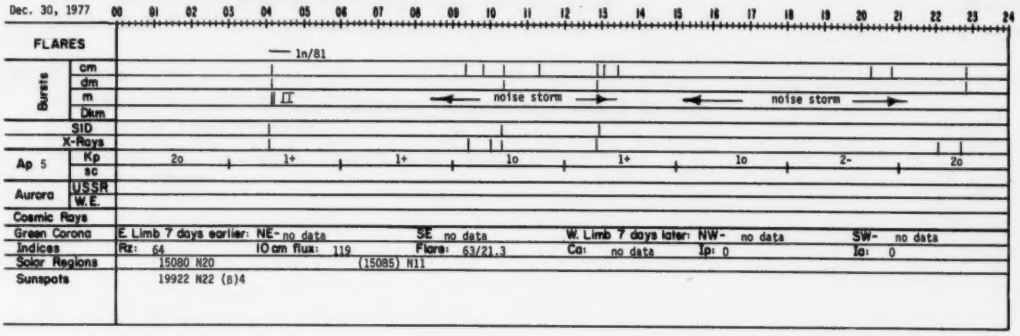


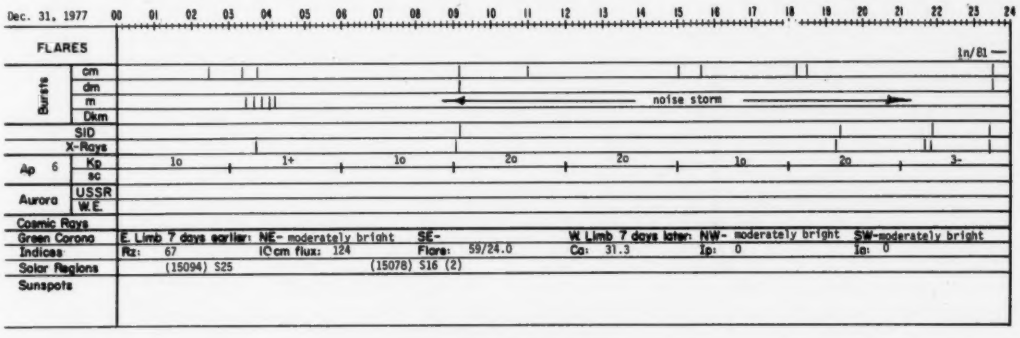
Remarks Proton Event: About midday the 20-40 MeV proton detector on board IMPs 7 and 8 recorded a sharp rise to maximum in the particle flux.





Remarks — Proton Event: The satellite-level proton flux enhancement, which IMPs 7 and 8 detected initially on Dec. 27, decayed to background level by the end of the day.





REGIONAL FLARE INDEX

INCLUDES ALL FLARES

HC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
15044	N21	77/12/02.1	77/11/28	77/12/08	48.88	4.44	17
15057	N17	77/12/04.2	77/12/05	77/12/05	1.44	1.44	1
15049	S22	77/12/06.6	77/11/30	77/12/10	220.73	20.07	57
15053	N16	77/12/07.1	77/12/03	77/12/03	2.10	2.10	1
15065	N17	77/12/08.8	77/12/12	77/12/12	2.14	2.14	1
15060	N 1	77/12/09.2	77/12/10	77/12/10	7.09	7.09	2
15056	S25	77/12/11.2	77/12/05	77/12/17	988.02	45.23	76
15061	N27	77/12/14.6	77/12/08	77/12/19	19.76	1.65	14
15062	S25	77/12/16.6	77/12/11	77/12/16	22.42	3.74	8
15067	N18	77/12/18.2	77/12/10	77/12/20	42.84	3.82	11
15074	S26	77/12/21.6	77/12/20	77/12/27	78.39	9.80	41
15078	N23	77/12/24.3	77/12/18	77/12/29	87.75	7.31	26
15077	S27	77/12/26.5	77/12/27	77/12/27	3.59	3.59	1
15075	N19	77/12/29.4	77/12/22	78/01/04	72.23	5.16	14
15088	N20	77/12/30.7	77/12/27	78/01/05	98.88	9.88	35
15079	N21	77/12/31.9	77/12/26	77/12/31	23.19	3.86	5

Miscellaneous Data

Contents

	Page
Solar Radio Waves	
Spectral Observations; Harvard, Manila and Sagamore Hill; May 1978	52-58
Spectral Observations, Culgoora, April 1978	59-66
Selected Events by Radioheliograph, April 1978	67-69
Cosmic Rays	
Neutron Monitor Daily Values, Alert and Deep River, March - April 1978	70
Chart of Variations, Alert and Deep River, April 1978	71

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	1005	MANI							0146.0	0146.5	1	III
			MANI							0258.2	0301.7	1	IIIG
			MANI							0538.6	0539.1	1	III
	0943	2339	SGMR				1000.0	2339.0	1				CONT
			SGMR				1545.0	1547.1	3				IIIG
	1245	2245	HARV				1546	1547	3	1546	1547	3	IIIG
			HARV				1612		2	1612		2	I
			HARV				1620	1920	1				IN
			HARV				1715	1718	3	1715	1718	3	IIIG
			HARV				1806	1917	2	1806	1917	2	IIIN
			SGMR				1824.5	1828.0	2				IIIG
			HARV	1828	1829	2	1821	1830	3	1821	1830	3	IIIGG
			HARV				1845		3				IIIG
			HARV	1921	1929	2	1918	1930	2				I
			SGMR				1927.0	1943.0	3				IIIG
			HARV	1932	1933	2	1927	1937	3	1927	1937	3	IIIGG
			HARV	1939	1942	2						IV	
			HARV				1940	2028	3	1940	2028	3	IC
			HARV	1942	2108	3	1942	2028	3			IV	
			HARV				1942	2028	3	1942	2028	3	IIIS
			SGMR				1943.0	1949.0	3			II	
			SGMR				1949.0	1959.0	3			IV	
			HARV				2028	2245	2	2028	2245	2	IC
	2141	2400	MANI										
02	0000	1000	MANI							0116.7	0116.9	1	III
			MANI							0306.1	0306.4	1	III
			MANI							0611.2	0616.5	1	IIIG
			MANI							0638.8	0641.5	1	IIIG
	0941	2348	SGMR				1115.6	1115.9	1				III
			SGMR				1245.3	1245.5	1				III
			SGMR				1407.0	1800.0	1				CONT
	1245	2245	HARV				1407	2245	1				IN
			HARV				1453		2				IIIG
			SGMR				1511.0	1515.5	3				V
			HARV				1559		2	1559		2	IIIB
			HARV				1607		2	1607		2	IIIB
			HARV				1611	1615	3	1611	1615	3	IIIGG,V
			HARV				1657	1700	2	1657	1700	2	IIIGG
			HARV				1725	2233	1	1732	2233	1	IIIN
			HARV				1737	1738	2	1737	1738	2	IIIG
			SGMR				1744.2	1746.0	2				IIIG
			HARV				1744	1753	3	1744	1753	3	IIIGG
			HARV				2001	2004	2	2001	2004	2	IIIGG
			HARV				2019	2028	2	2019	2028	2	IIIGG
			SGMR				2125.0	2125.1	1				III
			HARV				2125	2127	2	2125	2127	2	IIIG
	2128	2400	MANI										
			HARV				2145	2157	3	2145	2157	3	IIIGG
			SGMR				2147.0	2151.1	1				IIIG
03	0000	1001	MANI							0121.8	0122.1	1	III
			MANI							0254.4	0256.5	1	IIIG
			MANI							0449.8	0450.3	1	III
			MANI							0459.5	0501.0	1	IIIG
			MANI							0659.3	0700.3	1	III
	0940	2341	SGMR				1028.0	2341.0	1				CONT
			SGMR				1150.8	1204.1	3				V
			SGMR				1207.5	1242.0	3				V
			SGMR				1242.0	1329.0	2			IV	
	1245	2245	HARV				1306	1528	1				IN
			HARV				1331		2	1331		2	IIIB
			HARV				1422	1423	2				IIIG
			HARV				1426	1427	2	1426		2	IIIG
			HARV				1459	1500	1	1459	1500	1	IIIG
			HARV				1528	1638	2				IC
			HARV				1538	1642	2	1538	1642	2	IIIN
			HARV				1638	2017	3	1748	2017	3	IC
			SGMR				1642.8	1656.2	2				IIIG
			HARV				1643	1711	3	1643	1711	3	IIIS

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
03			SGMR				1656.2	1702.3	3				IV
			HARV	1656	1703	3	1656	1704	3	1656	1704	3	IIIGG,V
			SGMR				1703.0	1712.0	2				IIIG
			HARV				1711	2131	3	1711	2131	3	IIIN
			HARV				1829	1831	3	1829	1831	3	V
			HARV	1908	1909	2	1908	1909	2				IIIG
			HARV				2017	2245	2				IC
	2140	2400	MANI										
04	0000	1000	MANI										
	0939	2342	SGMR				1102.4	1102.6	3				III
			SGMR				1102.6	2342.0	1				CONT
			SGMR				1145.2	1158.9	3				V
	1245	2245	HARV				1254	1323	1				IN
			HARV				1323	1340	2				I
			SGMR				1335.3	1339.2	3				V
			HARV				1335	1339	3	1335	1339	3	IIIGG
			HARV				1340	1519	1				IN
			HARV				1519	2245	2				I
			HARV				1556	2212	2	1556	2212	2	IIIN
			HARV				1556		2				U
			HARV				1749	1750	3	1749	1750	3	IIIG
			HARV				1812	1815	3	1812	1815	3	IIIGG
			SGMR				1821.0	1823.0	3				IIIG
			HARV				1822	1826	3	1822	1826	3	IIIGG,V
			HARV				1832	1841	3	1832	1841	3	IIIGG,V
			SGMR				1833.8	1839.2	3				V
			SGMR				1847.7	1856.0	3				IIIG
			HARV				1849	1858	3	1849	1858	3	IIIGG
			HARV				1902		3	1902		3	IIIG
			HARV				2055	2056	3	2055	2056	3	IIIG
			HARV				2233	2238	3	2235	2238	3	IIIGG
	2128	2400	MANI							2329.2	2332.0	1	IIIG
05	0000	1000	MANI							0305.3	0306.0	1	III
			MANI							0317.3	0317.9	1	III
			MANI							0325.0	0325.5	1	III
			MANI							0524.0	0527.8	1	IIIG
			MANI							0557.4	0557.6	1	III
			MANI							0614.2	0614.6	1	III
			MANI							0624.6	0624.8	1	III
			MANI							0654.8	0656.1	1	IIIG
			MANI							0745.4	0745.6	1	III
	0937	2343	SGMR				1026.3	1036.3	3				V
			SGMR				1227.6	2343.0	2				IIIS
	1245	2245	HARV				1300	2245	1				INW
			HARV				1308	1309	1				IIIG
			HARV				1316	1318	2				IIIG
			HARV				1330	1331	1	1331		1	IIIG
			HARV				1356	1358	2	1356	1358	2	IIIG
			SGMR				1403.1	1405.4	3				IIIG
			HARV	1403	1405	3	1403	1409	3	1403	1409	3	IIIGG
			HARV	1411	1412	2	1411	1412	2	1411	1412	2	IIIGG
			HARV	1416		2	1416		2				IIIG
			HARV				1435	1438	2				IIIGG
			HARV				1445	1449	2	1445	1449	2	IIIGG
			HARV				1507	1514	1	1507	1514	1	IIIGG
			HARV				1524	1529	2	1524	1529	2	IIIGG
			HARV				1603		2				U
			HARV				1606	1607	3	1607		3	IIIG,V
			HARV				1633	1645	3	1634	1645	3	IIIGG
			SGMR				1639.9	1644.0	3				V
			HARV				1650	1653	2	1650	1653	2	IIIG
			HARV				1707		1	1707		1	IIIB
			SGMR				1714.2	1714.5	3				V
			HARV				1714	1715	3	1714	1715	3	IIIG,V
			HARV				1806		1	1806		1	IIIB
			HARV				1833	1847	2	1833	1847	2	IIIGG
			HARV				1852	1858	3	1852	1858	3	IIIGG
			SGMR				1856.4	1857.5	3				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
05			HARV				1956	2005	2	1956	2005	2	IIIGG
			HARV				2038		3	2038		3	IIIB
			HARV				2052	2056	2	2052	2056	2	IIIGG
			HARV				2105	2110	2	2105	2110	2	I,IIIGG
			HARV				2136	2150	2	2140	2149	2	IIIG
			SGMR				2155.7	2208.7	3				V
	2130	2400	MANI							2201.3	2203.0	1	IIIG
			HARV	2204	2208	3	2155	2209	3	2155	2209	3	IIIGG
			HARV				2211	2219	2				IIIGG
			HARV				2243	2245	2	2243	2244	2	IIIGG
			MANI							2354.1	2354.6	1	III
06	0000	1003	MANI							0211.9	0212.5	1	III
			MANI							0410.5	0410.7	1	III
			MANI							0436.7	0437.2	1	III
	0936	2344	SGMR				1216.3	1217.5	1				III
	1245	2245	HARV	1300	1301	3							IIIG
			SGMR				1413.3	1413.4	1				III
			HARV				1843	1855	2	1843	1855	2	IIIGG
			SGMR				1853.3	1854.3	2				IIIG
			HARV				1950	1954	2	1950	1954	2	IIIG
			HARV				2004		2	2004		2	IIIB
			HARV				2016	2025	2	2016	2025	2	IIIG
			HARV	2019	2021	3	2019	2043	3	2026	2043	3	II
			SGMR				2024.3	2034.0	3				V
			HARV				2026	2034	3	2026	2034	3	H
			SGMR				2034.0	2140.0	1				CONT
			HARV				2047		3				IIIB
			HARV	2058	2115	3							IVN
			HARV				2058	2215	2				I
			SGMR				2120.2	2123.1	3				V
			HARV	2122		1	2118	2125	3	2118	2125	3	IIIGG,V
	2139	2400	MANI										
			HARV				2158		2				IIIG
07	0000	1005	MANI							0329.9	0351.5	3	IV
	0935	2345	SGMR				1111.6	1126.7	1				IIIG
			SGMR				1227.8	1243.1	3				IIIG
	1245	2245	HARV	1531	1536	2	1533	1538	3	1533	1538	3	IIIGG,V
			SGMR				1533.4	1535.2	3				V
			HARV				1548	1549	1				IIIG
			SGMR				1550.7	1554.0	3				V
			HARV	1550	1556	3	1550	1556	3	1551	1556	3	IIIGG,V
			HARV	1550	1557	3	1550	1557	2				IV
			SGMR				1554.0	2345.0	1				CONT
			HARV				1555	1620	3	1603	1620	3	II
			SGMR				1558.0	1608.0	3				II
			HARV				1601	1620	3				IIIGG,RS
			SGMR				1607.5	1615.0	3				IV
			HARV	1625		1	1625		1	1625		1	IIIG
			HARV	1710	1711	3	1710	1711	3	1710	1711	3	IIIG
			HARV	1758	1759	3	1759	1801	3	1759	1801	3	IIIGG
			HARV				1807	1957	2	1825	1957	2	IIIN
			HARV				2025	2026	2	2025	2026	2	IIIG
			HARV	2124		2	2124	2125	2	2124	2125	2	IIIGG
	2130	2400	MANI										
08	0000	0508	MANI							0216.8	0218.0	1	III
			MANI							0327.5	0329.5	1	III
			MANI							0404.2	0404.4	1	III
	0552	1003	MANI							0807.2	0807.3	1	III
	0934	2346	SGMR				1215.8	1225.0	3				II
			SGMR				1221.3	1227.1	3				IIIG
			SGMR				1228.3	1235.0	3				IV
			SGMR				1235.0	2230.0	2				CONT
			SGMR				1244.0	1344.0	2				IV
	1245	2245	HARV	1255	1256	2							IV
			HARV	1312	1322	2	1312	1322	2				IV
			HARV				1450	1451	1				IIIG
			HARV	1542	1546	2	1543	1546	3	1543	1546	3	IIIGG,V

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
08			SGMR				1543.6	1546.7	3				IIIG
			HARV				1726		2	1726		2	IIIG
			HARV				1818	1821	3	1818	1821	3	IIIG
			SGMR				1903.8	1905.0	3				V
			HARV				1903	1904	3	1903	1904	3	IIIG,V
			HARV				1929	1930	3	1929	1930	3	IIIG
	2126	2400	MANI										
09	0000	1001	MANI							0641.2	0645.2	1	IV
			MANI							0705.5	0709.0	1	IIIG
	1245	2245	HARV	1437		2							UNCL
			HARV				1439	1453	3				II
	0932	2348	SGMR				1440.6	1447.0	1				II
			HARV	1445	1447	2	1445	1447	2				IV
			SGMR				1503.0	1900.0	1				CONT
			HARV	1511	1530	2							IVN
			HARV				1531		2	1531		2	IIIG
			HARV				1558		1	1558		1	I
			HARV				2017		2				IIIB
			HARV				2103		1				IIIB
			HARV				2142		1				IIIB
	2130	2400	MANI							2336.0	2336.5	1	III
10	0000	1002	MANI										
	1245	2245	HARV				1846		1	1846		2	IIIB
	0931	2349	SGMR				2202.3	2202.6	2				V
			HARV				2202	2205	2	2202	2205	2	IIIG,U
			SGMR				2208.6	2222.5	3				IV
	2123	2400	MANI							2209.0	2216.3	3	IV
			HARV				2209	2223	3	2209	2223	3	UNCL,H,C
11	0000	1000	MANI							0259.9	0312.8	2	IV
	0930	2350	SGMR				1215.8	1216.5	1				V
			SGMR				2022.5	2222.8	2				III
	1245	2245	HARV	2022	2023	1	2022	2023	2	2022	2023	2	IIIG
	2135	2400	MANI										
12	0000	1000	MANI										
	0929	2351	SGMR										
	1245	2245	HARV										
	2116	2400	MANI										
13	0000	1004	MANI							0744.5	0750.0	1	IV
	1245	2245	HARV										
	0928	2352	SGMR				1511.4	1511.6	1				III
	2136	2400	MANI										
14	0000	1003	MANI										
	0927	2353	SGMR				1353.0	1401.0	2				IIIG
	1245	2400	HARV				1358	1401	2				II
			HARV	1403	1410	1							IV
			HARV				1449	1456	2	1450	1452	1	II
			SGMR				1450.0	1458.1	1				II
			HARV				1511		1	1511		1	IIIB
			HARV				1933		1	1933		1	IIIG
	2120	2400	MANI										
15	0000	1002	MANI							0242.7	0243.0	1	III
			MANI							0251.3	0251.5	1	III
			MANI							0301.0	0301.7	1	IIIG
			MANI							0329.1	0330.1	1	IIIG
	0926	2354	SGMR				1533.7	1533.9	2				III
	1245	2245	HARV				1534		3	1534		3	IIIB
			HARV				1542		2	1542		2	IIIG
			SGMR				1627.0	1627.7	2				V
			HARV				1627		3	1627		3	IIIG
			HARV				1655		2	1655		2	IIIG
			SGMR				1810.5	1811.4	1				IIIG
			HARV				1810	1811	2	1810	1811	3	IIIG
			HARV				2032		2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
16	0000	1000	MANI							0839.2	0839.4	1	III
	0925	2355	SGMR				1307.7	1308.0	1				IIIG
	1245	2245	HARV				1530	1830	1				I
			HARV				1558	1636	2	1627	1636		I
			HARV				1611	1617	2	1611	1616	2	IIIGG
			SGMR				1613.3	1636.6	1				IIIG
			HARV				1619	1629	2	1623	1629	2	II
			SGMR				1622.8	1627.3	1				II
			HARV				1636	1830	1				IN,W
			HARV				1829		3	1829		3	IIIG
			HARV				1911		2	1911		2	IIIG
			SGMR				1929.0	1929.8	3				V
			HARV				1929		3	1929		3	IIIG,V
			HARV				2042		1				IIIB
	2131	2400	MANI										
			SGMR				2157.1	2158.5	3				V
			HARV	2157		2	2157	2158	3	2157	2158	3	IIIG,V
17	0000	1005	MANI										
	0924	2356	SGMR				1220.7	1222.0	1				V
			SGMR				1503.0	1505.5	1				IIIG
	1245	2245	HARV				1503	1505	3	1503	1505	3	IIIGG
			HARV	1515		1							IIIG,V
			HARV				1617		2	1617		2	IIIB
			HARV				1710		1	1710		1	IIIB
			HARV				1750		2	1750		2	IIIB
			HARV				1842	1927	1	1842	1927	1	IIIN,W
	2124	2400	MANI										
18	0000	1001	MANI							0010.4	0010.5	1	III
			MANI							0029.4	0029.8	1	III
			MANI							0113.4	0113.7	1	III
			MANI							0520.5	0525.0	1	III
	0923	2357	SGMR				1030.0	1715.0	1				CONT
	1245	2245	HARV				1320	1340	1				IN,W
			HARV				1340	1428	1				I,IIIN
			HARV				1428	1943	1				IN,W
			HARV				1717	2134	1	1717	2134	1	IIIN
			HARV	1752	1754	2	1751	1754	1	1751	1754	1	IIIG
			SGMR				1828.5	1832.3	2				IIIG
			HARV				1828	1833	3	1828	1833	3	IIIGG
	2124	2400	MANI										
19	0000	0955	MANI										
	0922	2358	SGMR				1118.0	1123.4	2				V
	1245	2245	HARV				1735		2	1735		2	IIIB
	2126	2400	MANI										
20	0000	1000	MANI										
	0921	2359	SGMR				1245.2	1245.4	1				III
	1230	2245	HARV	1302	1311	2							IIIG,C
			SGMR				1319.3	1319.4	1				III
			SGMR				1411.8	1412.0	1				III
			HARV				1506		1				IIIB
			SGMR				1635.9	1640.7	2				IIIG
			HARV				1635	1640	3	1635	1640	3	IIIGG
			HARV				1811		2	1811		2	IIIG
	2135	2400	MANI										
21	0000	0945	MANI										
	0920	2400	SGMR				1233.0	1233.3	1				III
	1230	2245	HARV				1527		2				IIIG
			SGMR				1607.7	1607.9	2				III
			HARV				1608		3	1608		3	IIIB
			SGMR				1650.2	1651.5	2				V

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
21			HARV				1650	1651	3	1650	1651	3	IIIG
			HARV				1658		1	1658		1	IIIB
			SGHR				1759.8	1800.2	3				IIIG
			HARV				1800		3	1800		3	IIIB,V
			HARV				2046	2049	2	2046	2049	2	IIIG
			SGHR				2048.5	2048.9	1				IIIG
	2124	2400	MANI										
			HARV				2136	2147	3	2136	2147	3	IIIG
			SGHR				2136.3	2142.6	3				IIIG
22	0000	0951	MANI							0204.5	0208.4	2	IIIG
			MANI							0308.2	0309.0	2	III
	0919	2401	SGHR				1039.6	1245.0	2				IIIS
			SGHR				1338.3	1339.8	2				V
	1230	2345	HARV				1432	1434	2	1434		2	IIIG
			SGHR				1433.9	1435.0	3				V
			SGHR				1624.7	1628.8	3				V
			HARV	1624	1625	1	1624	1627	3	1624	1627	3	IIIGG,V
			HARV				1633		1	1633		1	IIIB
			SGHR				1836.3	1839.0	3				V
			HARV				1837	1841	3	1837	1841	3	III,V
			HARV	1905		3	1905		3				IIIG
	2128	2400	MANI										
23	0000	0948	MANI										
	0919	2402	SGHR										
	1230	2245	HARV				2019		1	2019		1	IIIG
	2136	2400	MANI										
24	0000	0945	MANI										
	0918	2403	SGHR				1752.6	1808.8	2				IIIG
	1230	2235	HARV				1752	1756	3	1752	1756	3	IIIGG
			HARV				1759	1815	3	1801	1815	3	II
			HARV				2013	2014	3	2013	2014	3	IIIG
			HARV				2041		2	2041		2	IIIG
			HARV	2123		1	2122	2124	1				IIIG
	2137	2400	MANI										
25	0000	0945	MANI										
	0917	2404	SGHR				1329.8	1330.0	1				III
			SGHR				1527.8	1528.7	3				V
	1230	2245	HARV				1528		3	1528		3	IIIB,V
			HARV				1531	1533	1	1531	1533	1	IIIG
			HARV				1657	1707	2	1657	1707	2	IIIN
			SGHR				1752.3	1754.9	3				V
			HARV				1752	1755	3	1752	1755	3	IIIG,V
			SGHR				1848.0	1849.1	1				V
			HARV				1848	1849	3	1848	1849	3	IIIG
			HARV				2032	2034	2	2032	2034	2	IIIG
	2115	2400	MANI										
26	0000	0950	MANI										
	0916	2404	SGHR				1026.0	2200.0	1				CONT
	1230	2245	HARV				1314	1750	1				IN
			HARV				1604	2225	1	1604	2225	1	IIIN
			HARV	1752	1758	2	1752	1759	3	1752	1759	3	IIIGG
			SGHR				1754.8	1756.3	3				IIIG
			SGHR				1759.8	1823.4	2				IIIG
			HARV				1858	1903	3	1858	1903	3	IIIGG,V
			HARV				1922	1923	3	1922	1923	3	IIIG
	2142	2400	MANI										
			SGHR				2221.5	2225.5	2				IIIG
27	0000	0536	MANI										
	0632	0945	MANI										
	0916	2405	SGHR				1120.0	2405.0	1				CONT
	1230	2245	HARV				1637	2113	2	1637	2113	2	IIIN
			HARV				1705	1713	3	1705	1713	3	IIIGG,DC
	2145	2400	MANI										
28	0000	0733	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
28	0742	0940	MANI										
	1230	2245	HARV				1314	1318	2	1314	1318	2	IIIGG
			HARV				1627	1629	1	1627	1629	1	IIIG
			HARV				1649		3	1649		3	IIIB
	2152	2400	MANI										
			SGMR										
29	0005	0359	MANI										
	1230	2245	HARV				1508	1509	1				IIIG
	2235	2400	MANI										
			HARV	2242	2243	3	2242	2243	3				IIIGG
			SGMR										
30	0000	0947	MANI										
	1230	2245	HARV				1310		1	1310		1	IIIB
			HARV	1515	1516	2	1516	1517	2	1516	1517	2	IIIG
			HARV	1522		3							IIIG
	2131	2400	MANI										
			SGMR										
31	0000	0958	MANI										
	1230	2245	HARV				1507		3	1507		3	IIIB
			HARV				1610	2217	1				IN
			HARV				1630	1632	2	1630	1632	2	IIIG
			HARV				1742		2	1742		2	IIIB
			HARV				1845	1846	3	1845	1846	3	IIIG
	1900	2409	SGMR										
	2140	2400	MANI										

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (<10) of bursts
GG = Large group (>10) of bursts
C = Underlying continuum (particularly with Type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

Note: See page 139 of *Solar-Geophysical Data*, Prompt Reports, Number 407, for the May 1978 spectral observations from Culgoora, Durnten and Weissenau. NGSDC must take the blame for failing to include the Manila and Sagamore Hill data tabulated here with those from Culgoora, Durnten and Weissenau. The Harvard data, on the other hand, simply arrived too late.

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
01	0000	0735	CULG				0223.5		1				IIIB
			CULG	0403	0403.5	1	0403	0403.5	1				IIIG
			CULG	0407	0407.5	1	0407	0407.5	1				IIIG
			CULG	0601	0601.5	1	0601	0601.5	1				IIIG
			CULG	0614	0725								IS,W
			CULG				0709	0710					IIIG,W
	2036	2400	CULG	2036	2040	1							I
			CULG				2117.5	2118	1				IIIG
			CULG	2321	2321.5	1	2321	2321.5	1				IIIG
02	0000	0720	CULG				0025	0105					IN,W
			CULG	0101		1							IIIB
			CULG	0127.5		1	0127.5		1				IIIB
			CULG				0142	0144.5	1				IIIG
			CULG	0144	0251								IN,W
			CULG	0225.5	0226.5	2	0225.5	0226.5	2				IIIG,U
			CULG				0245	0310	1				IIIS
			CULG	0300.5	0301.5	1	0300.5	0301.5	1				IIIG
			CULG				0304.5	0305.5	2				IIIG
			CULG				0315	0330					IN,W
	2036	2400	CULG	2141	2214								IN,W
03	0000	0735	CULG				0301	0319					IS,W
			CULG				0542	0551	1				II
			CULG				0643	0722					IIIN,W
			CULG	0648	0715.5								IN,W
	2035	2400	CULG				2035	2400					IIIS,W
			CULG	2050	2151.5								IIIN,W
			CULG	2051.5	2052	2	2051.5	2052.5	2				IIIG,V,U
			CULG				2056	2057	1				SLOW DRIFT
			CULG				2353	2354	1				IIIG,U
04	0000	0735	CULG				0000	0735					IIIS,W
			CULG	0144.5		1	0144.5	0145	2	0145.5		1	IIIG,U
			CULG	0224	0224.5		0224	0224.5					IIIG,W
			CULG				0304	0500					IS,W
			CULG				0457	0458.5	1				IIIG,U
			CULG				2035	2057	1				IS,C
	2035	2400	CULG				2035	2314					IIIS,W
			CULG				2057	2120					IS,W
05	0000	0735	CULG				0047.5		1				IIIB,U
			CULG				0106.5	0735					IIIN,W
			CULG				0509	0511.5	1				IIIGG,U
			CULG	0512	0513.5								IIIG,W
	2035	2400	CULG				2035	2400					IIIS,W
			CULG	2035	2040	1							IIIN
			CULG	2306	2307	1							IIIG
			CULG	2308.5	2309	1							IIIG
			CULG	2316.5		1	2316.5		1				IIIB
			CULG	2340	2400								IS,W
06	0000	0734	CULG	0000	0734	1							IS,DC
			CULG				0000	0734					IIIN,W
			CULG				0000	0430					IS,W
			CULG	0058.5	0059	1	0058.5	0059	1				IIIG
			CULG				0109	0109.5	1				IIIG
			CULG				0237.5	0238	1				IIIG,U
			CULG				0312	0313	1				IIIG
			CULG				0430	0734	1				IS
			CULG	0511	0714	1							IIIGN
			CULG				0541	0542.5	1				IIIGG,V
			CULG				0545		2				IIIG,U
			CULG				0548		1				IIIG,U
			CULG				0552		1				IIIG,U
			CULG	2035	2400	1	2035	2217.5	1				IS
			CULG	2049.5		1	2049.5		1				IIIB
			CULG	2120	2121	1	2120	2121	2				IIIG
			CULG				2131		1				UNCLF
	2035	2400	CULG	2157	2400	1	2035	2400	1				IIIS

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
06			CULG				2200.5	2201.5	1				IIIB,U
			CULG	2209.5	2210.5	2	2209.5	2211	3				IIIG,V,U
			CULG				2217.5	2400	1				IS
			CULG	2221	2221.5	1	2221	2221.5	1				IIIG
			CULG	2236.5	2237	1							IIIG
			CULG				2236		1				IIIB
			CULG	2345	2346	1	2345	2346	1				IIIG
			CULG	2348	2352	1	2347.5	2352	2				IIIGG
			CULG	2357.5	2358	1	2357.5	2358	1				IIIG
07			CULG	0000	0035		0000	0221					IN,W
	0000	0734	CULG	0000	0129		0000	0130					IIIN,W
			CULG				0001	0002	3	0001.5		2	IIIGG
			CULG				0031.5		1				IIIB
			CULG	0049	0050	1	0049	0050	2				IIIG
			CULG				0102	0102.5	1				IIIG
			CULG	0129	0129.5	2	0129	0129.5	2				IIIG,U
			CULG				0130	0734	1				IIIS
			CULG	0131	0734	1	0131	0419	1				IIIG,N
			CULG				0221	0312.5	1				IS
			CULG				0323	0323.5	2				IIIB,U
			CULG				0419		2				IIIG,V,U
			CULG				0435.5	0436	2				IIIG
			CULG	0513.5	0514	2							IIIG
			CULG	0521.5	0522	2							IIIG
			CULG	0541.5	0734	2	0541.5	0734	2				IIIG,N
			CULG	0621	0622	2	0621	0622	3				IIIG,V,U
			CULG	0639	0640	2	0639	0640	3				IIIG,V
			CULG	0705.5	0708	2	0705.5	0708.5	2				IIIGG,U
			CULG	0709.5	0711.5	2	0709.5	0711.5	3				IIIGG,V
			CULG				2034	2400	1				IIIS
			CULG				2034	2141	2				IS,C,DC
	2034	2400	CULG	2034	2400								IS,W
			CULG	2049	2136	1	2049	2136	2				IIIG,N
			CULG				2049	2056.5	1				II? DC
			CULG				2116	2117	2				IIIG
			CULG				2120	2124	2				IIIGG
			CULG				2141	2400	1				IS,DC
			CULG	2224.5	2225	2	2223	2226	2				IIIGG,V,U
			CULG				2353	2354.5	2				IIIGG
08			CULG	0000	0147								IN,W
	0000	0740	CULG				0000	0050	2				IS,DC
			CULG				0000	0734	1				IIIS
			CULG	0044.5	0049.5	1	0044.5	0049.5	1				IIIGG
			CULG				0049.5	0225.5	1				IIIN
			CULG				0050	0147					IS,W
			CULG				0137.5	0138.5	1				IIIGG
			CULG	0147	0535	1	0147	0734	1				IS,DC
			CULG	0147	0445	2	0155	0734	2				IV
			CULG				0208.5	0209.5	1				IIIG
			CULG				0208	0220.5	2				II
			CULG	0422.5	0434	2	0422.5	0434	2	0423.5	0425	1	IIIGG
			CULG				0429	0429.5	1				UNCLF
			CULG				0438	0444	1				II? DC
			CULG	0440.5	0442	3	0440.5	0442.5	3	0441	0442.5	2	IIIGG,V
			CULG	0509	0513	1	0509	0513	1				IIIG
			CULG	0535	0730								IN,W
	2034	2400	CULG				2034	2400	1				IS,DC
			CULG				2034	2400	1				IIIS
			CULG	2034	2400	1							IIIN
			CULG	2036	2400	2	2036	2400	2				IIIG,N
			CULG	2043.5	2044.5	1	2043.5	2044.5	2				IIIG
			CULG	2052	2053	2	2052.5	2053	3	2053		1	IIIGG
			CULG	2113	2114	1	2113	2114	1				IIIG
			CULG				2207	2212	2				DC
			CULG	2214.5	2215	2	2214.5	2215	2				IIIG
			CULG				2238.5	2239	2				IIIG
			CULG	2310	2312.5	1	2309.5	2312.5	2				IIIGG,U
			CULG	2319	2320	2	2319	2320	2				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
08			CULG				2322.5	2326.5	1				DC
09			CULG				0000	0734	1				IIIS
			CULG	0000	0135								IN,W
	0000	0734	CULG				0000	0042	1				IS
			CULG	0004.5	0010	1	0004.5	0010	2				IIIGG,U
			CULG	0011	0012.5	1	0011	0012.5	1				IIIG
			CULG	0016.5	0018.5	1	0016.5	0018.5	1				IIIG
			CULG				0042	0224					IS,W
			CULG	0105.5	0107	2	0105.5	0107	3				IIIGG,V,U
			CULG	0108.5	0110.5	1	0108.5	0110.5	2				IIIGG
			CULG	0111.5		1	0111.5		1				IIIG
			CULG	0113		1	0113		1				IIIC
			CULG	0135	0734	1							IN,DC
			CULG				0217.5	0218	1				UNCLF
			CULG				0224	0450	1				IN,DC
			CULG				0228.5	0229.5	2				IIIG
			CULG	0315	0320.5	2	0314.5	0322.5	3	0315	0315.5	2	IIIGG
			CULG				0325	0328.5	2	0327.5		1	IIIGG
			CULG	0337	0338	1	0337.5	0338.5	1				SLOW DRIFT
			CULG				0353	0420.5	1				IIIG,N
			CULG	0419	0419.5	1	0418	0420.5	2				IIIG
			CULG	0444.5	0450	1	0444.5	0450	2	0446.5	0447.5	1	IIIGG,U
			CULG				0446.5	0447.5	3				IIIGG,V
			CULG				0450	0734	1				IS,DC
			CULG				0523	0524	1				IIIG
			CULG	0536	0724.5	1							IS,C
			CULG	0652	0652.5	1	0651	0652.5	2				IIIG
			CULG	0655	0655.5	1	0655	0655.5	1				IIIG
			CULG	0703.5	0705	2	0703.5	0705	2				IIIG
			CULG	0709.5	0711	1	0709.5		1				IIIG
			CULG				0711.5		2				IIIB
			CULG	0714.5	0715	1	0714.5	0715	1				IIIG
	2035	2400	CULG				2035	2400	1				IIIS
			CULG	2042.5	2342								IIIN,W
			CULG	2045	2048	2	2045	2045.5	2				IIIG
			CULG	2053	2053.5	1	2053	2054	2				IIIG
			CULG				2054	2055	1				II? SLOW DRIFT
			CULG				2054	2055	1				UNCLF
			CULG				2058.5	2110	1				IIIB,N
			CULG				2102	2400	1				IS,DC
			CULG				2140.5		2				UNCLF
			CULG				2157	2158	2				IIIG,U
			CULG				2212.5	2216	2				IIIGG,V
			CULG	2222.5		1	2222.5		1				IIIB
			CULG				2239	2240	2				IIIG
			CULG	2248	2250.5	1							IIIN
			CULG	2251.5		1	2251.5	2253.5	3	2251	2252	1	IIIGG,V,U
			CULG	2255	2257	1	2249.5	2257	3				IIIGG
10	0000	0733	CULG				0000	0733					IIIN,W
			CULG	0037		1	0037		1				IIIB
			CULG				0129	0129.5	1				IIIB
			CULG				0134.5	0136.5	2				IIIGG
			CULG	0136.5	0139	1	0136.5	0139	1				IIIN
			CULG	0148	0148.5	1	0148	0149	2	0148	0148.5	2	IIIG
			CULG	0217.5	0219	1	0219	0224	2	0219.5	0221.5	1	IIIGG,U
			CULG	0222.5	0224	1							II? SLOW DRIFT
			CULG				0223.5	0229	2				II, HB
			CULG				0248.5	0249.5	3	0248.5	0249	2	IIIGG,V
			CULG	0248.5	0256.5	1	0247	0256.5	1	0248	0249	1	IIIGG,V
			CULG	0253	0306	1	0253	0306	1				IIIS
			CULG				0258	0303	1				II? SLOW DRIFT
			CULG				0259		2				IIIB
			CULG				0313	0314.5	3	0313.5	0314	2	IIIG,V
			CULG	0313	0314.5								IIIG,W
			CULG				0316	0317	2				IIIG
			CULG				0337	0337.5	1				IIIG
			CULG	0406	0458								IN,W
			CULG	0447	0449	2	0447	0449.5	3	0447	0448.5	2	IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
10			CULG				0458	0459	1				UNCLF
			CULG				0504		1				UNCLF
			CULG				0532.5		1				UNCLF
			CULG				0532	0533	1				IIIB
			CULG				0551.5	0553	3				IIIGG,V
			CULG	0611	0619	2	0611	0613.5	1				IIIGN
			CULG				0633.5	0722	2				IIIGN
			CULG				0709		1				UNCLF
	2034	2400	CULG				2034	2400					IIIN,W
			CULG	2048		1							UNCLF
			CULG	2101	2101.5	2	2101	2102	3				IIIG
			CULG	2103.5		1	2103	2104	2				IIIG
			CULG	2200.5		1	2200.5	2202.5	2				IIIG
			CULG				2228	2229.5	2	2228.5	2229	2	IIIG
			CULG	2324.5		1	2324.5	2329	2	2324.5	2328.5	1	IIIG
			CULG	2349.5	2351	1	2349	2352	2	2351.5	2352	1	IIIGG
11	0000	0733	CULG				0000	0733					IIIN,W
			CULG	0055	0056.5	1							IIIG
			CULG				0056		1				IIIB
			CULG				0159	0201.5	1				IIIG
			CULG				0234.5	0235	1				IIIB
			CULG	0301	0303	1	0301	0303	2				IIIG,V
			CULG				0338.5	0339.5					I
			CULG				0414		1				IIIB
			CULG	0444.5	0539	1	0444.5	0733	2				IS,DC
			CULG	0504	0504.5	1	0503.5	0504.5	2				IIIGG
			CULG	0605	0606	1	0604.5	0607.5	2				IIIGG,V
			CULG				0619	0620	1				IIIG
			CULG				0642.5	0647	1				UNCLF
			CULG	2033	2347	1	2033	2120.5	2				IIIG,N
	2033	2400	CULG				2033	2124	1				IIIS
			CULG				2106	2109.5	1				IS
			CULG				2121.5	2125.5	1				II?
			CULG	2121	2121.5	1	2121	2121.5	1				IIIG
			CULG				2124.5	2400					IIIN,W
			CULG				2149.5	2347.5	2				IIIG,N
			CULG	2154	2154.5	2	2154	2156	3				IIIG,V
			CULG				2216.5	2217	3				IIIG
			CULG				2235	2236.5	2				IIIG,U
			CULG				2237	2241	2				IIIG,U
			CULG	2344.5		1	2344.5		3				IIIG
			CULG	2346	2347		2346	2347					IIIG,W
12	0000	0733	CULG	0000	0010.5	1	0000	0733	1				IIIN
			CULG				0022.5	0121.5	1				IS
			CULG	0023.5	0024	2	0023.5	0025.5	3	0024	0025.5	2	IIIG,U
			CULG				0039	0040.5	1				IIIGG
			CULG				0047.5	0049	2				IIIGG
			CULG				0052	0052.5	2				IIIB,U
			CULG				0114.5	0733	2	0117	0117.5	1	IIIG,N
			CULG	0148.5	0149	2	0148.5	0149	2				IIIG
			CULG				0202	0204	2	0202.5	0203	2	IIIGG
			CULG				0206	0207	2	0206.5		1	IIIGG
			CULG				0211	0213.5	2	0212.5		1	IIIGG
			CULG	0223	0223.5	2	0223	0224.5	2	0223	0224	2	IIIG,V
			CULG				0236.5	0241	2	0237	0237.5	2	IIIGG
			CULG				0304	0304.5	3	0304	0304.5	1	IIIG
			CULG				0328.5	0330	2	0329		1	IIIGG
	2033	2400	CULG	2036	2036.5	1	2036	2036.5	3				IIIG
			CULG				2037	2041	2				IIIGG
			CULG				2037	2400					IN,W
			CULG				2041.5	2400					IIIN,W
			CULG				2115	2137	2				IIIS
			CULG				2208	2324.5	2				IIIG,N
			CULG	2214	2224.5	1							IIIN
			CULG				2242	2245	2	2242.5	2244.5	1	IIIGG,V
			CULG				2325.5	2328	3	2325.5	2327	2	IIIGG,V
13	0000	0732	CULG				0000	0732	2				IIIG,N

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
13			CULG				0000	0732	1				IIIN
			CULG	0001.5	0003	1	0001.5	0003	3	0001.5	0003	2	IIIGG
			CULG				0032.5	0039	2	0036.5	0037.5	1	IIIGG,V
			CULG	0046.5	0049	1							IS
			CULG				0121.5	0123.5	2				IIIG,V
			CULG				0236		2	0236		1	IIIB,V
			CULG				0241.5	0242.5	3	0241.5	0242.5	2	IIIGG
			CULG				0247	0248	2	0247		1	IIIG
			CULG				0404	0405	3	0404.5	0405	1	IIIGG,V,U
			CULG				0408	0409	1	0408	0409	1	IIIGG
			CULG				0446.5	0449.5	3				IIIGG,V,U
			CULG				0626	0630	3				IIIGG,V
			CULG	0708.5	0709	2	0706	0710.5	3				IIIGG
	2022	2400	CULG				2022.5	2400	1				IS,DC
			CULG				2022.5	2400					IIIS,W
			CULG				2044	2318	2				IIIG,N
			CULG	2257.5	2258	1							IIIG
14	0000	0732	CULG				0000	0732	2				IS
			CULG				0000	0130					IIIS,W
			CULG				0010.5	0031	2				IIIS
			CULG	0021.5	0022.5	1	0021.5	0031	2				II
			CULG	0022	0026	1	0029	0145	2				IV
			CULG	0130	0732		0130	0732					IIIN,W
			CULG				0132	0725	2	0132.5		1	IIIG,N
			CULG				0132	0133	2	0133		1	IIIG
			CULG				0158	0159.5	2	0158		1	IIIG
			CULG				0202		2	0202		1	IIIG
			CULG				0323.5	0327.5	2	0326.5	0327.5	1	IIIGG
			CULG				2032	2400	1				IIIS
	2032	2400	CULG				2032	2400	2				IIIGN
			CULG	2032	2400	1							IS
			CULG				2032	2400	2				IS,C
			CULG	2037	2038	1	2036.5	2037.5	2				IIIG
			CULG				2201	2202.5	2				IIIG
			CULG	2206.5	2207	1	2205.5	2207.5	3				IIIGG
15	0000	0732	CULG				0000	0244.5	1				IIIS
			CULG	0000	0732	1							IS
			CULG				0000	0640	2				IS,C,DC
			CULG				0047	0051.5	2				IIIGG
			CULG				0215	0228.5	2				IIIGG
			CULG				0244	0732	1				IIIN
			CULG				0340.5	0348	2				IIIGG
			CULG	0529.5	0531	2	0515.5	0534.5	2				IIIG,N
			CULG	0631	0657	2	0630.5	0646	3				IIIS
			CULG				0637.5	0648	1				UNCLF
			CULG				0648	0732	1				IV
	2032	2400	CULG				2032	2400	2				IS,C,DC
			CULG				2045	2341					IIIS,W
			CULG				2120.5	2126	2				IIIS
			CULG				2131.5	2138	2				IIIS
			CULG				2154	2155	2				IIIG
			CULG	2158		2	2158	2158.5	2				IIIG
			CULG				2211	2218.5	1				IIIS,U
			CULG				2213.5	2215	1				RS,DC
			CULG	2341	2342	1	2341	2343	2	2342.5		1	IIIG
			CULG				2345	2400	1				IIIS
16			CULG				0000	0412	1				IS,D,DC
	0000	0732	CULG				0000	0030	1				IIIS
			CULG				0000	0042.5	1				IIIS
			CULG				0042.5		1				IIIB
			CULG				0043	0239					IIIN,W
			CULG	0144.5		1	0144.5	0146	2	0144.5	0145	1	IIIGG
			CULG	0147.5		2							IIIG
			CULG				0214	0216	2	0214.5		1	IIIGG
			CULG				0239	0732					IIIS,W
			CULG	0355	0400	1	0355	0401.5	2				IIIN
			CULG				0412	0732	1				IS,DC

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
16			CULG	0435	0732								IN,W
			CULG				0453		2				IIIB,U
			CULG				0520	0732	2				IIIG,N
			CULG				2032	2400	1				IIIS
	2032	2400	CULG				2032	2400	1				IS,C,DC
			CULG	2108.5	2400	1							IN
			CULG				2125	2131.5	2				IIIS
			CULG				2316	2317	1				SLOW DRIFT
			CULG				2323	2325.5	1				SLOW DRIFT
			CULG				2340	2345	1				II
			CULG				2347.5	2349.5	1				IIIGG
17			CULG	0000	0730								IN,W
			CULG				0000	0023.5					IIIS,W
	0000	0730	CULG				0000	0320	1				IS,C,DC
			CULG				0023.5	0051	1				IIIS
			CULG				0051	0730					IIIN,W
			CULG	0216	0217	1	0216	0217	1				IIIG
			CULG				0249.5	0301	1				SCINTLLTNS
			CULG				0320	0400	2				IS,DC
			CULG				0400	0546					IS,W
			CULG				0546	0730	1				IS
			CULG	0621	0621.5	1	0616.5	0623.5	1				IIIGG
	2034	2400	CULG				2034	2152	2				IS,C,DC
			CULG				2034	2400					IIIN,W
			CULG				2152	2310	1				IS,DC
			CULG				2310	2400	1				IS
18	0000	0730	CULG				0000	0106					IS,W
			CULG				0106	0630	1				IS
			CULG	0109	0113	1	0109	0115	3	0109	0112	2	IIIGG
			CULG							0109	0224	1	S.W.F.
			CULG	0109	0123	2	0121	0500	2				IV
			CULG				0111	0126	3				II
			CULG				0120	0122	2	0120.5	0121	2	IIIG
			CULG				0121	0122	3				II?
			CULG	0123	0730	1							IV
			CULG				0214	0216	2				IIIG
			CULG				0216.5		1				IIIB
			CULG				0412	0730	1				IIIN
			CULG				0611		2				IIIB
			CULG				0617		2				IIIG
	2031	2400	CULG				2031	2400					IIIN,W
			CULG				2038		1				IIIB
			CULG				2138		1				IIIB
19	0000	0717	CULG				0045	0717					IIIN,W
			CULG				0208.5	0209	2				IIIG
			CULG				0325	0326	2	0325.5	0326	1	IIIG
			CULG				0542	0549	1				II?
			CULG	0544	0545	1	0544	0545.5	2				IIIGG
			CULG				0548.5	0549	2				IIIG
			CULG				0559	0613	1				II
	2031	2217	CULG				2050.5						IIIB,W
			CULG				2052.5						IIIB,W
			CULG				2217	2217.5					IIIG,W
20	0530	0731	CULG				0542	0657					IIIN,W
	2031	2400	CULG				2056	2400					IIIN,W
			CULG				2103.5		1				IIIB
			CULG				2234.5	2242					II, W
			CULG				2304.5	2305.5	2				IIIG,U
			CULG				2345	2351	2				IIIG
			CULG				2350	2400					IS,W
21	0000	0731	CULG				0000	0010					IS,W
			CULG				0556	0706					IIIN,W
			CULG	0717.5	0718		0716	0721.5					IIIGG,W
			CULG	0725.5	0727	1	0724	0727	2				IIIGG
			CULG				0729.5	0731	1				II

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
21	2031	2400	CULG				2044	2400					IIIN,W
			CULG				2211.5	2218.5					IIIGG,W
			CULG				2303.5	2305	1				IIIGG
			CULG				2314.5	2317					IIIG,W
22	0000	0730	CULG	0035.5	0730		0803	0730					IIIN,W
			CULG	0053.5	0054	1	0053.5	0054.5	2	0053.5	0054	1	IIIG
			CULG				0059.5	0100	2				IIIB
			CULG				0232.5		1				IIIB
			CULG				0450.5	0453	2				IIIGG
	2031	2400	CULG				2033	2055.5	1				IS
			CULG				2035.5	2400					IIIN,W
			CULG				2036		1				IIIB
			CULG				2055.5	2203					IN,W
			CULG				2134.5	2135.5	2				IIIG,U
			CULG	2159.5	2400	1							IIIG,N
			CULG	2201	2201.5	1							IIIG
			CULG				2203	2243	1				IS
23	0000	0730	CULG				0000	0046	1				IIIS
			CULG				0002.5	0003	2				IIIG
			CULG	0002.5	0046	1							IIIN
			CULG				0009	0010.5	2				IIIGG
			CULG	0030.5	0504		0006	0053					IN,W
			CULG				0105	0441					IIIN,W
			CULG	0120	0121	2	0120	0121	3	0120	0121	2	IIIGG
			CULG				0352.5	0353	2				IIIG
			CULG	0430	0730								IN,W
			CULG	0435.5		2	0435.5	0436	2				IIIG
			CULG	0441		1	0441	0443	3				IIIGG,V
			CULG	0441	0506	2							IIIG,N
			CULG				0443	0508	2				IIIS
			CULG				0457	0500	1				II?
			CULG				0508	0730					IIIN,W
			CULG				0516	0517	1				I
			CULG				0538	0541.5	2				IIIGG,V,U
			CULG				0623	0710	2				IS
			CULG				0713	0713.5	2				IIIB,U
	2030	2400	CULG	2030	2040	1	2030	2141	1				CONT
			CULG	2046	2047	1							IIIG
			CULG				2131	2400	1				IIIN
			CULG				2137.5	2400	1				IS,DC
			CULG				2357.5	2359	2				IIIG
24	0000	0730	CULG				0000	0730	1				IS,DC
			CULG				0110.5	0730	1				IIIN
			CULG	0200	0201.5	1	0159.5	0205.5	2	0200.5	0201	1	IIIGG
			CULG				0434	0435	1				IIIB,V
			CULG				0723	0725	2				IIIGG
			CULG				0723	0725	1				SLOW DRIFT
	2030	2400	CULG				2054.5	2208					IIIN,W
25	0000	0730	CULG	0304	0305	1							I
			CULG				0314.5	0645					IIIN,W
			CULG				0426	0429	1				IIIGG
	2030	2400	CULG				2118.5	2400	1				IIIN
			CULG	2209	2216.5	1	2209	2216.5	1				IIIG
26	0000	0257	CULG				0053.5						IIIB,W
			CULG				0056.5		1				IIIB
			CULG				0108.5	0109.5	1				IIIG
			CULG				0253	0254.5	1				IIIG,U
	0625	0730	CULG										
	2030	2400	CULG				2132	2136	2				IIIGG
			CULG				2230.5	2231	1				UNCLF
27	0000	0726	CULG				0035	0038	2				IIIGG,V,U
			CULG				0038.5	0040	2				IIIG
			CULG	0049.5	0052.5	1							IN
			CULG				0128.5	0136	1				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS
APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
27			CULG	0208.5	0458	1	0208.5	0708	1				IIIG,N
			CULG	0307.5	0308	1	0306.5	0308.5	1				UNCLF
	2033	2400	CULG				2033	2400					IS,W
			CULG				2130	2400					IIIN,W
			CULG	2356.5	2357	1							IIIG
28	0000	0730	CULG				0000	0425					IN,W
			CULG	0009	0014.5	2	0009.5	0014.5	2				IIIGG,V,U
			CULG	0010.5	0017	1	0010.5	0015	1			IV	
			CULG				0015	0730					IIIN,W
			CULG				0425	0550	1				IS,C
			CULG				0550	0730	1				IS
	2030	2400	CULG				2044	2045	1				IIIG
			CULG				2115.5		1				IIIG
			CULG				2126	2400	1				IIIN
			CULG				2158		2				IIIB
			CULG	2310	2320	1							I
			CULG				2315.5	2316	1				IIIG
			CULG				2338		1				IIIB
			CULG	2342.5	2346.5	1	2342.5	2346.5	1				IIIGG
			CULG	2353	2356	1	2353	2356	1				IIIG
29	0000	0730	CULG	0000	0022		0000	0730					IIIN,W
			CULG	0057	0730	1							IN
			CULG	0159	0200	1							IIIG
			CULG	0411.5	0412	1							IIIG
			CULG				0623.5		2				IIIB
	2030	2400	CULG	2035	2400	1	2035	2400	1				IS,C,DC
			CULG				2115	2400	1				IIIN
			CULG				2208	2210	2				IIIGG
30	0000	0715	CULG				0000	0715	1				IIIN
			CULG	0018.5	0338	1	0207.5	0221	1				I
			CULG	0107		1	0105.5	0108	2	0105.5		1	IIIGG,U
			CULG				0432	0432.5	1				IIIG
			CULG				0434	0438	1				IIIGG
			CULG	0454.5	0455.5	2							IIIG
			CULG				0644	0657.5	1				IIIS
			CULG				0710		1				IIIB
	2030	2400	CULG	2030	2400	1	2030	2400	2				IS,C
			CULG				2040	2146	1				IIIS
			CULG	2113	2113.5	1	2113	2113.5	1				IIIG
			CULG				2134	2141	1				UNCLF
			CULG				2146	2400	2				IIIS
			CULG				2223.5	2225.5	1				DC
			CULG				2245	2252	1				DC

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

Note: The quality of the Culgoora spectrograph film was poor during the period 23/0555 UT to 27/0620 UT.

SELECTED SOLAR EVENTS

APRIL 1978

Culgoora

UT Date 1978 April	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
2	0226	0227	80) 160)	1.0	300		2) 3)	IIIG,U	*
5	0200	0500	80) 160)	.8	10	See remark:	1	IS	Type I persisted from 4th - 10th 160 MHz becoming unpol. on 7th
	0509	0511	43.25) 80) 160)	.2	245		3) 2) 2)	IIIGG,U	
5/6	2300	0500	80) 160)	1.0	105	Unpol		IS	Type I persisted from 4th - 8th The region becoming RH pol. on the 7th
6	0058	0059	80) 160)	.9	30		1	IIIG	*
7	0129	0130	80) 160)	.8	0		3	IIIG,U	*
8	0044	0049	43.25) 80) 160)	.6	60) 90) 95)		3	IIIGG	*
	0150	0448	43.25) 80) 160)	1.0) .7) .7)	300		3)))	IVM)) IVS)	Complex source IVM moves to 1.6 $R_\odot$ then fades

Days without Heliograph observations: ..19,20.....

* Other type III's observed from same position during the day

UT Date 1978 April	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
8	0213	0218	43.25	1.0	300	-	3	II)	
	0440	0525	43.25) 80) 160)	.4	320	-	3) 3) 1)	IVS)	
9	0105	0113	43.25) 80) 160)	1.3 1.2 1.1	40	-	3	IIIGG,V,	U*
	0314	0323	43.25) 80) 160)	.8) .6) .2)	300	-	3	IIIGG	*
	2252	2253	43.25) 80) 160)	1.3 1.2 1.1	30	-	3) 3) 1)	IIGG,V,	U* Complex source Structure
10	0148	0150	43.25) 80) 160)	1.3 1.1 .9	300		3) 2) 2)	IIIG	*
	0219	0223	43.25) 80) 160)	1.3 1.2 1.1	30		3) 3) 2)	IIIGG,U	))) Complex source) Structure
	0223	0232	43.25) 80) 160)	1.3) 1.2) 1.1)	30		3	II	)
	2349	2352	43.25) 80) 160)	1.3) 1.0) .7)	230	-	3) 3) 2)	IIIGG	*

Days without Heliograph observations: .19,20.....

*Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

APRIL 1978

Culgoora

UT Date 197A April	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. (R_o)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
11	0301	0303	43.25) 80) 160)	.9	45	-	3	IIIG,V	*
	2249	2250	43.25) 80)	1.0	310	-	2	IIIG	*
12	0023	0026	43.25) 80) 160)	1.3) 1.2) 1.1)	240	-	3	IIIG,U	*
	0223	0225	43.25) 80) 160)	1.1) 1.0) .9)	25	-	3	IIIG,V	*
13	0122	0124	43.25) 80) 160)	1.0) .9) .7)	10		3)))))	IIIG	* Complex source
			43.25) 80)	1.2	20		)	V	
13/14	2300	0500	80) 160)	.8	35	L	1	IS	Complex type I source persisted until 19th

Days without Heliograph observations: 19,20.....

*Other type III's observed from same position during the day.

UT Date 197A April	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. (R_o)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
14	0016	0017	43.25) 80) 160)	1.3) 1.1) .9)	15	-	3	IIIG	*)))) Complex source Structure)))
	0021	0031	43.25) 80) 160)	1.1) 1.1) .9)	15	-	3	II	
	0031	0053	80) 160)	1.1 .9	15	- L	2	IV	
	0322	0331	43.25) 80) 160)	.8	15	-	3	IIIGG	*
15	0221	0224	43.25) 80) 160)	.8	10	-	3	IIIGG	*
16	0358	0401	43.25) 80) 160)	1.3) 1.1) .9)	340	-	3) 2) 2)	IIIGG	*
	2340	2345	43.25	1.3	270	-	3	II	
	2347	2349	43.25) 80) 160)	1.3	290	-	3	IIIGG	*
17/18	2300	0500	80) 160)	.8	140	R	1	IS	

Days without Heliograph observations: 19,20.....

*Other type III's observed at same position during the day.

SELECTED SOLAR EVENTS

APRIL 1978

Culgoora

UT Date 1978 April	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. (R_e)	Positions Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
18	0109	0113	43.25) 80) 160)	1.3) 1.0) .8)	270		3	IIIGG	*)
	0114	0120	43.25	1.0	260		3	II	)
	0120	0122	43.25) 80) 160)	1.3) 1.0) .8)	270		3) 3) 2)	IIIG	)
	0122	0520	43.25) 80)	1.0	260	See remarks	3	IV	) Complex polarization at 80 MHz.
19	0325	0326	43.25) 80) 160)	1.2	100	-	3	IIIG	*
21	2303	2305	43.25) 80) 160)	.8	150		2) 2) 1)	IIIGG	* Type III activity from this region also on 23rd.
	0052	0054	43.25) 80) 160)	1.0	0		3 2 2	IIIG	* Type III activity from this region also on 23rd
	0059	0101	43.25) 80) 160)	1.2) 1.1) 1.0)	260		3 3 2	IIIB	* Type III activity from this region also on 23rd.
23	0104	0105	80) 160)	1.0 .9	300	-	1	IIIG*	

Days without Heliograph observations: ..19,20.....

*Other type III's observed at same position during the day.

UT Date 1978 April	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. (R_e)	Positions Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
23	0443	0458	43.25) 80) 160)	1.0	250	-	3	IIIGG,V	
	0458	0505	80) 160)	1.2 1.1	0))	-	2) 1)	II	Spectral type not easily distinguishable
			160	1.1	55)	-	1)		
24	2359	0000	43.25) 80) 160)	.5	315	-	3	IIIG	
26	0108	0109	80) 160)	.7	250	-	3	IIIG	*
27	0035	0040	43.25) 80) 160)	1.0	45	-	3)	IIIGG,V,U	Complex source Structure
			80) 160)	.5	0		)		
	0128	0136	43.25) 80) 160)	.8	180		3) 2) 3)	IIIGG	
28	0010	0012	43.25) 80) 160)	.9	70		3	IIIGG,V,U	
	2342	2347	80)) 160)	.9	20		2) 3) 3)	IIIGG	*

Days without Heliograph observations: ..19,20.....

*Other type III's observed at same position during the day.

COSMIC RAY INDICES
(Neutron Monitors)
MARCH -APRIL 1978

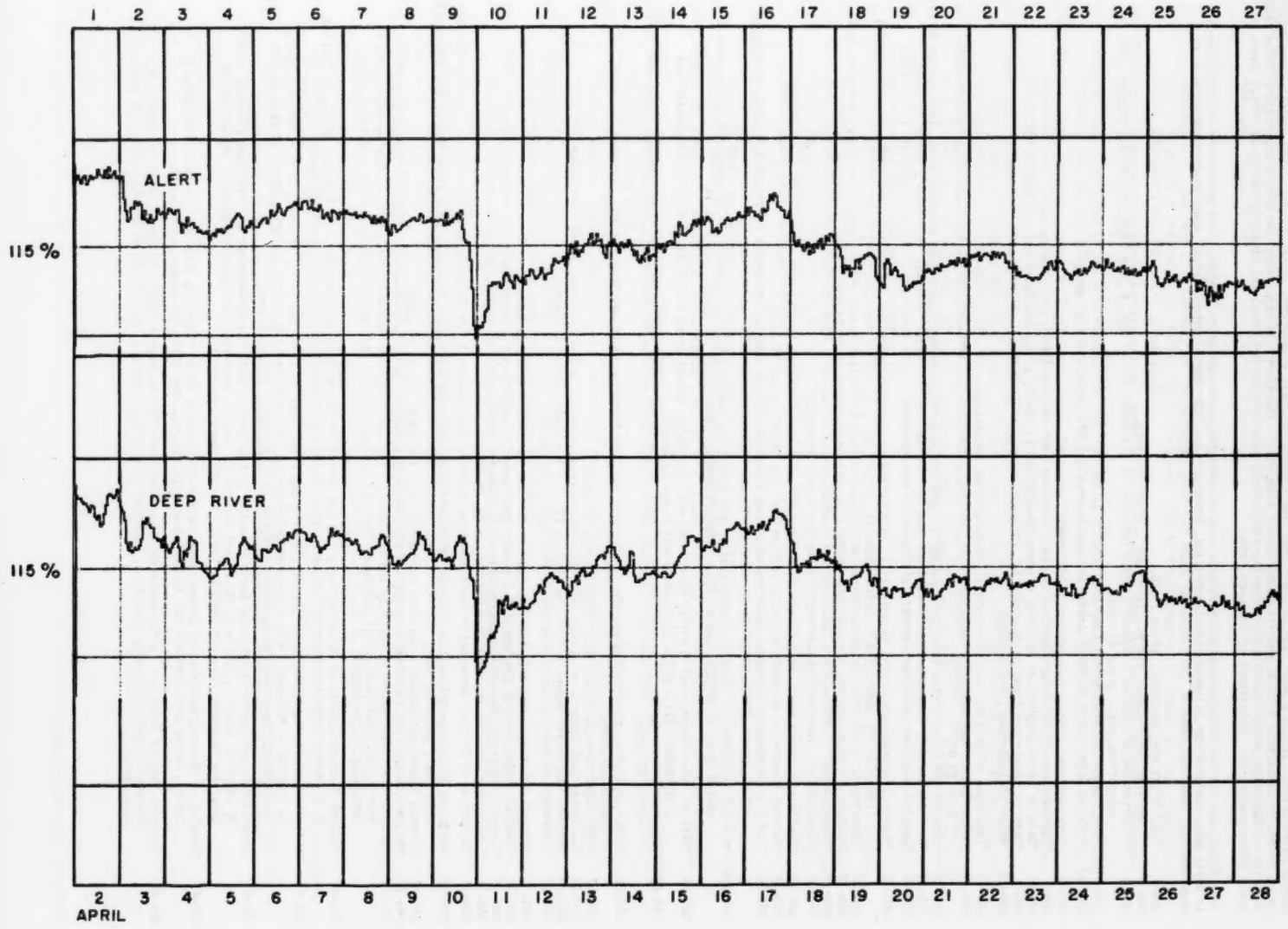
Date	ALERT	DEEP RIVER	Date	ALERT	DEEP RIVER
March 1978	Average cts/hr	Average cts/hr	April 1978	Average cts/hr	Average cts/hr
1	7360	6909	1	7462	7021
2	7352	6912	2	7477	7024
3	7371	6918	3	7342	6909
4	7342	6955	4	7289	6837
5	7392	6935	5	7272	6814
6	7414	6976	6	7323	6869
7	7405	6953	7	7337	6896
8	7339	6927	8	7308	6869
9	7072	6634	9	7284	6838
10	6910	6504	10	7230	6802
11	6935	6560	11	7007	6557
12	7086	6664	12	7091	6699
13	7177	6744	13	7188	6774
14	7248	6818	14	7170	6779
15	7298	6867	15	7232	6816
16	7356	6923	16	7287	6891
17	7401	6967	17	7337	6947
18	7428	6973	18	7202	6814
19	7453	6995	19	7124	6747
20	7468(21)	6700	20	7057	6694
21	7508	7001	21	7105	6705
22	7499	7041	22	7139	6715
23	7409	6972	23	7078	6722
24	7379	6962	24	7091	6700
25	7345	6886	25	7089	6711
26	7323	6892	26	7058	6663
27	7343	6890	27	7013	6635
28	7337	6902	28	7026	6628
29	7377	6927	29	7010	6636
30	7411	6962	30	6917	6544
31	7420	6974			
MEAN	7328	6879	MEAN	7185	6775

( ) Number of hours for which data are available if less than 24.
Scaling factors for Alert and Deep River are 100 and 300, respectively.

COSMIC RAY INDICES
Neutron Monitors)

COSMIC RAY INDICES
Neutron Monitors)

Bartels Rotation 1978 (April 1978)



71
Misc
Apr 78

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